№	Krok-2023
Topic	05.Redox titration
Task	What two working solutions are used in determination of hydrogen sulfide in mineral waters by means of iodometry (back titration)?
Correct answer	I2, Na2S2O3
B	$H_2C_2O_4$, $KMnO_4$
C	$AgNO_3$, H_2SO_4
D	NaOH, HCl
E	Na_2CO_3, HCI
№	Krok-2023
Topic	04.Gravimetry. Acid-basic titration.
Task	One of the classifications of titrimetric methods of analysis is based on the chemism of the reaction between the substance being analyzed and the titrant. What reaction is the basis for determining the amount of sodium carbonate using hydrochloric acid?
Correct answer	Neutralization reaction
B	Sedimentation reaction
C	Complexation reaction
D	Hydrolysis reaction
E	Redox reaction
	Krok-2023
Topic	01.Analysis of cations of I-III analytical groups
Task	In the process of systematic analysis of a cation mixture, iron (III) cations can be determined using the fractional method. What reagent is used for this purpose?
Correct answer	Potassium hexacyanoferrate (II)

B	Hydrochloric acid
C	Sodium dihydrogen phosphate
D	Nitric acid
E	Potassium chloride
	Krok-2023
Topic	05.Redox titration
Task	What reaction must be conducted by an analytical chemist during the preliminary tests to determine chromium (III) ions?
Correct answer	Reaction for formation of a perchromic acid after preliminary oxidation of chromium
B	Reaction with sodium hydroxide and hydrogen peroxide
C	Reaction with sodium hydroxide
D	Reaction with ammonia
E	Reaction with potassium permanganate
	Krok-2023
Topic	02. Analysis of cations of IV-VI analytical groups
Task	A potassium chromate solution was added into the solution being analyzed, which resulted in the formation of a yellow precipitate, soluble in acetic acid. What cations were present in the solution, as indicated by this qualitative reaction?
Correct answer	Strontium cations
B	Ammonium cations
C	Sodium cations
D	Magnesium cations
E	Potassium cations
№	Krok-2023
Topic	01.Analysis of cations of I-III analytical groups

Task	If an alkali is added into the solution being analyzed, the solution produces a gas when heated. This gas changes the color of a moist litmus paper from red to blue, which indicates the presence of the following in the solution:
Correct answer	Ammonium ions
B	Carbonate ions
C	Lead ions
D	Bismuth ions
E	Chloride ions
№	Krok-2023
Topic	05.Redox titration
Task	What method of titrimetric analysis is used to quantify streptocide (sulfanilamide) with a $KBrO_3$ solution in the presence of *KBr?*
Correct answer	Bromatometry
B	Dichromatometry
C	Vanadatometry
D	Iodometry
E	Permanganometry
№	Krok-2023
Topic	01.Analysis of cations of I-III analytical groups
Task	A 2M solution of *HCl* was added into the solution being analyzed, which resulted in formation of a white precipitate that turned black when processed with an ammonia solution. What cation is present in this solution?
Correct answer	Hg_2^{2+}
B	Mg^{2+}
C	Ag^{+}
D	Ba^{2+}

E	Pb^{2+}
№	Krok-2023
Topic	05.Redox titration
Task	What reactions and reagents under certain conditions allow the determination of certain ions in the presence of other ions?
Correct answer	Specific
B	General
C	Group
D	Selective
E	Characteristic
№	Krok-2023
Topic	04.Gravimetry. Acid-basic titration.
Task	What method is used for the quantification of medicinal substances with basic properties?
Correct answer	Acidimetry
B	Thiocyanatometry
C	Complexonometry
D	Permanganometry
E	Argentometry
№	Krok-2023
Topic	01.Analysis of cations of I-III analytical groups
Task	Ammoniacal buffer and 8- oxyquinoline solution were added into the solution containing cations of the fifth analytical group, which resulted in formation of a green-yellow precipitate. This qualitative reaction corresponds with the following cations:
Correct answer	Magnesium cations
B	Ammonium cations

C	Manganese cations
D	Iron (II) cations
E	Calcium cations
№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	What method is used for simultaneous elimination of the effect of foreign substances, concentration, and determination of concentration?
Correct answer	Extraction-photometric analysis
B	Fluorimetry
C	Polarimetry
D	Refractometry
E	Differential spectrophotometry
№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	Potentiometric methods of analysis are based on the use of:
Correct answer	Dependence of the electromotive force (EMF) of a galvanic cell on the concentration of the analyte
B	Dependence of the mass of the precipitate on the concentration of the analyte
C	A. Dependence of the volume of the produced gas on the concentration of the analyte
D	Dependence of the electric current on the concentration of the analyte
E	Dependence of the volume of the titrant on the concentration of the analyte
№	Krok-2023
Topic	04.Gravimetry. Acid-basic titration.
Task	What titration method must be used for determination of a volatile substance?

Correct answer	Back titration
B	Direct titration
C	Substitution titration
D	Titration of separate sample weights
E	Titration with instrumental fixation of the equivalence point
№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	According to the Pharmacopoeia, molecular mass of a high-molecular substance must be determined using:
Correct answer	Osmometry
B	Cryometry
C	Nephelometry
D	Potentiometry
E	Viscometry
№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	What potential forms at the interface between two solutions?
Correct answer	Diffusion potential
B	Electrokinetic potential
C	Contact potential
D	Electrode potential
E	Surface potential
№	Krok-2023
Topic	01.Analysis of cations of I-III analytical groups

Task	What substance is used as a primary standard in permanganometry, bromatometry, dichromatometry, iodometry, and cerimetry?
Correct answer	Arsenic (III) oxide
B	Potassium hydroxide
C	Sodium chloride
D	Sodium carbonate
E	Ammonium acetate
№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	What parameter is measured during conductometric titration of electrolyte solutions?
Correct answer	Electrical conductivity
B	Acidity of the environment
C	Concentration of the solution
D	Viscosity of the solution
E	Electromotive force
№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	Quantitative determination of copper salts by photometry must be conducted according to the calibration graph that is built within the following coordinates:
Correct answer	Light absorption intensity — wavelength
B	Optical density — concentration
C	Optical density — temperature
D	Optical density — liquid layer thickness
E	Optical density — wavelength
№	Krok-2023

Topic	04.Gravimetry. Acid-basic titration.
Task	What indicator is necessary for titration of a potassium iodide solution using a silver nitrate solution (direct titration)?
Correct answer	Fluorescein
B	Starch solution
C	Methyl orange
D	Ammonium iron(III) sulfate
E	Tropeolin 00
№	Krok-2023
Topic	05.Redox titration
Task	An analytical laboratory expert performs direct iodometric determination of ascorbic acid. What indicator must be used in this case?
Correct answer	Starch
B	Diphenylamine
C	Methyl red
D	Phenolphthalein
E	Methyl orange
№	Krok-2023
Topic	02.Analysis of cations of IV-VI analytical groups
Task	What is the color of the compound that forms as a result of reaction between salicylate ions and Fe^{3+} ions in an acidic environment?
Correct answer	Violet
B	Green
C	Blue
D	Black
E	Brown

№	Krok-2023
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	Polarography is one of the electrochemical methods of analysis. What parameter is used in polarographic analysis to identify the substance being analyzed?
Correct answer	Half-wave potential
B	Magnitude of the electromotive force
C	Height of a polarographic wave
D	Width of a polarographic wave
E	Position of a polarographic wave
№	krok 2017
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Bouguer-Lambert-Beer law is the basis of molecular absorption analysis. According to this law, optical density of a solution is:
Correct answer	Directly proportional to layer thi-ckness and concentration of a substance
B	Directly proportional to layer thi-ckness and absorption coefficient
C	Inversely proportional to layer thi-ckness and concentration of a substance
D	Directly proportional to concentration and inversely proportional to layer thi-ckness
E	Directly proportional to concentration and inversely proportional to absorption coefficient
№	krok 2017
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	To determine mass fraction of sodium chloride in a drug, the Fajans method should be applied. Titration is to be performed in the presence of the following indicator solution:
Correct answer	Fluorescein
B	Methyl red

C	Potassium chromate
D	Ammonium iron (III) sulfate
E	Phenolphthalein
№	krok 2017, 2016
Topic	Oxidation-reducing titration
Task	Sulfanilamide drugs contain primary aromatic amides in their structure. Specify the method of quantitative determi-nation of these compounds:
Correct answer	Nitritometry
B	Iodometry
C	Dichromatometry
D	Permanganatometry
E	Cerimetry
№	krok 2017
Topic	Analysis of anions
Task	Chloroform and sodium nitrite solution were added into the acidulous investigated solution. The chloroform layer colored red-violet, which indicates the presence of:
Correct answer	Iodide ions
B	Carbonate ions
C	Chloride ions
D	Sulfate ions
E	Fluoride ions
№	krok 2017
Topic	Analysis of cations of I-III analytical groups
Task	Dry residue received after evaporation of the investigated solution turns previously colorless burner flame yellow, which is observed as violet through blue glass. What cations are there in the dry residue?

Correct answer	Na^{+}, K^{+}
B	Na^{2+}, K^{+}
C	Na^{+}, Sr^{2+}
D	Li^{+}, Ba^{2+}
E	Na^{+}, Ca^{2+}
№	krok 2017
Topic	Analysis of cations of I-III analytical groups
Task	Investigated solution contains potassium and ammonium ions. Specify the reagent that can indicate the presence of potassium ions in this solution:
Correct answer	Potassium tetraiodomercurate
B	Sodium chloride
C	Sodium acetate
D	Potassium hexacyanoferrate (II)
E	Uranyl zinc acetate
№	krok 2017
Topic	Analysis of cations of I-III analytical groups
Task	In the process of qualitative analysis to determine strontium ions, so-called ”gypseous water” is used. This substance can be defined as:
Correct answer	Concentrated aqueoussolution of $CaSO_4$
B	Solution of $Ca(OH)_2$
C	Concentrated aqueous solution of CO_2
D	Aqueous solution of $Ba(NO_3)_2$
E	solution of $AgNO_3$
№	krok 2017
Topic	Analysis of cations of I-III analytical groups

Task	In the process of qualitative analysis to determine strontium ions, so-called ”gypseous water” is used. This substance can be defined as:
Correct answer	Concentrated aqueous solution of $CaSO_4$
B	Solution of $Ca(OH)_2$
C	Concentrated aqueous solution of CO_2
D	Aqueous solution of $Ba(NO_3)_2$
E	solution of $AgNO_3$
№	krok 2017
Topic	Oxidation-reducing titration
Task	What standard solution can be used to standardize the solution of I_2?
Correct answer	Sodium thiosulfate solution
B	Potassium iodide solution
C	Potassium dichromate solution
D	Potassium permanganate solution
E	Sodium nitrite solution
№	krok 2017
Topic	Analysis of anions
Task	Pharmacopoeia reaction to determi-ne benzoate ions requires interaction wi-th the solution of:
Correct answer	Iron (III) chloride
B	Potassium chloride
C	Resorcin
D	Acetic anhydride
E	Diphenylamine
№	krok 2017, 2016
Topic	Gravimetry. Acid-basic titration.

Task	Choose the indicator and titration method to determine hydrogen carbonate ions in a drug:
Correct answer	Methyl-orange, acidimetry
B	Phenolphthalein, acidimetry
C	Methyl-orange, alkalimetry
D	Phenolphthalein, alkalimetry
E	Murexide, acidimetry
№	krok 2017
Topic	Analysis of anions
Task	Pharmacopoeia reaction to determi-ne phosphate ions is a reaction with magnesia mixture. It results in producti-on of white crystalline precipitate gNH_4PO_4. Magnesia mixture consists of the following:
Correct answer	$MgCl_2$, $NH_3 \cdot H_2O$, NH_4Cl
B	$MgCl_2$, $NaOH$, $NaCl$
C	$MnCl_2$, $NH_3 \cdot H_2O$, $NaCl$
D	$MgCl_2$, $MnSO_4$, NH_4Cl
E	$MgCl_2$, NH_4Cl
№	krok 2017
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	Name the mercurimetry titrant:
Correct answer	0,1 M solution of $Hg_2(NO_3)_2$
B	0,1 M solution of $NaNO_2$
C	0,1 M solution of $AgNO_3$
D	0,1 M solution of $KSCN$
E	0,1 M solution of NH_4SCN
№	krok 2017, 2016, 2015, 2011

Topic	Analysis of cations of IV-VI analytical groups
Task	What cation of the 4th analytical group is present in a solution, if its reacti-on with the group reagent results in formation of yellow precipitate?
Correct answer	Cr^{3+}
B	Zn^{2+}
C	Sn^{2+}
D	Al^{3+}
E	$Sn(IV)$
№	krok 2017
Topic	Precipitating titration. Complexime-ter. Physico-chemical methods of analysis.
Task	Direct titration **CANNOT** be applied for quantitative determinati-on of calcium chloride by means of permanganatometry, because:
Correct answer	The investigated substance does not interact with the titrant
B	The reaction runs very quickly
C	It is impossible to select the indicator to determine titration end point
D	Side reactions are possible
E	The reaction runs slowly
№	krok 2017
Topic	Precipitating titration. Complexime-ter. Physico-chemical methods of analysis.
Task	During mercurimetric titration of halogenide ions in the presence of di-phenylcarbazone, at the titration end point the precipitate is produced. This precipitate will be colored:
Correct answer	Blue
B	Red
C	Yellow
D	Green

E	Brown
№	krok 2017, 2016
Topic	Oxidation-reducing titration
Task	When determining oxidizing agents by means of iodometry in the presence of starch the following phenomenon can be observed at the titration end point:
Correct answer	Blue coloring disappears
B	Red coloring appears
C	Green coloring of precipitate appears
D	Green coloring of solution disappears
E	White precipitate occurs
№	krok 2017
Topic	Analysis of cations of I-III analytical groups
Task	Hydrochloric acid was added into the solution under investigation. The resulting precipitate was filtered, then this filter cake was processed with hot water; after the filtrate cooled, *KI* soluti-on was added into it. What cation was present in the solution, if the precipitate was colored yellow?
Correct answer	Pb^{2+}
B	Ag^{+}
C	Hg^{2+}
D	Ca^{2+}
E	Ba^{2+}
№	krok 2017
Topic	Gravimetry. Acid-basic titration.
Task	When cations are divided into analytical groups according to the acid-base classification, group reagents can be acids or bases. What acids can be used as group reagents?

Correct answer	HCI, H_2SO_4
B	HNO_3, CH_3COOH
C	H_3PO_4, $H_2C_2O_4$
D	$HClO_4$
E	H_2CO_3
№	krok 2017
Topic	Analysis of cations of I-III analytical groups
Task	The third analitycal group of cations (acid-base classification) includes Ca^{2+}, Sr^{2+}, Ba^{2+}. What acid can function as a precipitator agent (group reagent) for these cations?
Correct answer	H_2SO_4
B	HNO_3
C	HCI
D	CH_3COOH
E	$HClO_4$
№	krok 2017, 2016
Topic	Analysis of cations of I-III analytical groups
Task	Reaction of sodium ions with potassium hexahydroxoantimonate (V) in neutral medium produces precipitate. Specify the color of this precipitate:
Correct answer	White
B	Red
C	Yellow
D	Green
E	Blue
№	krok 2017

Topic	Analysis of anions
Task	Reaction with potassium permanganate is used to detect reducing anions. Specify the anion that decolorizes potassium permanganate:
Correct answer	Sulfite
B	Carbonate
C	Tetraborate
D	Sulfate
E	Arsenate
№	krok 2017
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Specify the substance that can be determined by means of polarimetry:
Correct answer	Glucose
B	This method will suffice for any substance
C	Sulfuric acid
D	Sodium chloride
E	Benzene
№	krok 2017, 2016, 2015
Topic	Analysis of cations of IV-VI analytical groups
Task	What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?
Correct answer	Ni^{2+}
B	Ca^{2+}
C	Na^{+}
D	Mn^{2+}
E	Co^{2+}
№	krok 2017
Topic	Analysis of anions

Task	A solution of hydrogen peroxide in an acid medium was added into investi-gated solution, leading to blue coloring of the resulting solution. This analyti-cal effect indicates the presence of the following anions:
Correct answer	$Cr_2O_7^{2-}$
B	MnO_4^-
C	$C_2O_4^{2-}$
D	NO_3^-
E	Cl^-
№	krok 2017
Topic	Precipitating titration. Complexime-ter. Physico-chemical methods of analysis.
Task	Total content of chloride, bromide, and iodide ions in the investigated solution can be quantitatively determined with the following titrant:
Correct answer	Silver nitrate solution
B	Potassium dichromate solution
C	Sodium thiosulfate solution
D	Potassium permanganate solution
E	Sodium nitrite solution
№	krok 2017
Topic	Gravimetry. Acid-basic titration.
Task	Gravimetry (precipitation method) is used for quantitative determination of sulfates in potable water. What substance should be used as precipitator for sulfates?
Correct answer	$BaCI_2$
B	KCI
C	$MgCI_2$
D	$NaCI$

E	NH_4NO_3
№	krok 2017
Topic	Oxidation-reducing titration
Task	Among the given substances choose the one that is used for oxidation of organic compounds:
Correct answer	$KMnO_4$
B	$CH_3 - CH_3$
C	$NaOH$
D	HCl
E	$NH_2 - NH_2$
№	krok 2016
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	A chemical laboratory received a drug that is a mixture of glucose and mannose. To identify these substances in the mixture the following method can be applied:
Correct answer	Thin-layer sorbent chromatography
B	Polarimetry
C	Spectrophotometry
D	Polarography
E	Amperometric titration
№	krok 2016
Topic	Analysis of anions
Task	Solution under analysis received chloroform and, drop by drop, chlorine water. Chloroform layer colored orange, which indicates the presence of:
Correct answer	Bromide ions
B	Iodide ions
C	Sulfite ions

D	Sulfate ions
E	Nitrate ions
№	krok 2016
Topic	Precipitating titration. Complexime-ter. Physico-chemical methods of analysis.
Task	In titration analysis aimed at determining the substances by means of mercurimetry the followi-ng substance can be used as the indicator:
Correct answer	Diphenylcarbazide
B	Potassium chromate
C	Eriochrome black T
D	Starch
E	Tropeolin OO
№	krok 2016, 2015
Topic	Precipitating titration. Complexime-ter. Physico-chemical methods of analysis.
Task	The Mohr method is used to determine mass concentration of sodium chloride in an isotonic soluti-on. Titration is carried out with the following indicator:
Correct answer	Potassium chromate
B	Fluorescein
C	Ammonium iron (III) sulfate
D	Diphenylcarbazone
E	Ferroin
№	krok 2016
Topic	Analysis of cations of IV-VI analytical groups
Task	The fourth group of cations includes the following cations: Al^{3+}, Sn^{2+}, $Sn(IV)$, $As(V)$, $As(III)$, Zn^{2+}, Cr^{3+}. The group reagent for the fourth group of cations is the solution of:
Correct answer	$NaOH$, H_2O_2

B	HCl
C	NH_3, H_2O_2
D	$H_2C_2O_4$
E	H_2SO_4, H_2O_2
№	krok 2016
Topic	Analysis of cations of I-III analytical groups
Task	In the qualitative analysis that involves precipitation of sulfates of the third analytical group cations (Ca^{2+}, Sr^{2+}, Ba^{2+}) the solubility of sulfates can be reduced by adding:
Correct answer	Ethyl alcohol
B	Distilled water
C	Benzene
D	Chloroform
E	Amyl alcohol
№	krok 2016, 2015, 2012
Topic	Analysis of anions
Task	Nitrite ions in presence of nitrate ions can be detected with:
Correct answer	Crystalline antipyrine in presence of diluted HCl
B	Crystalline sodium thiosulfate
C	Dimethylglyoxime
D	Crystalline iron (III) sulfate
E	Diphenylcarbazone
№	krok 2016
Topic	Analysis of cations of I-III analytical groups

Task	Temperature does not affect reaction rate Potassium dichromate solution was added into a solution obtaied after the precipitate consisti-ng of group II chloride cations was processed with hot water. Yellow precipitate was produced; the preci-pitate is insoluble in acetic acid, but soluble in alkali. What cations were present in the solution under investi-gation?
Correct answer	Lead (II)
B	Mercury (II)
C	Barium
D	Silver (I)
E	Calcium
№	krok 2016, 2015
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	Thiocyanatometric titration method requires secondary standard solution of potassium thiocyanate. This solution is standardized with standard solution of:
Correct answer	Silver nitrate Thiocyanatometric titration method requires secondary standard solution of potassium thiocyanate. This solution is standardized with standard solution of:
B	Hydrochloric acid
C	Sulfuric acid
D	Iron (II) sulfate
E	Copper (II) nitrate
№	krok 2016
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	To identify a drug by means of thin-layer chromatography the following parameter is used:
Correct answer	R_f

B	n
C	E , mV
D	I , A
E	K_p
№	krok 2016
Topic	Oxidation-reducing titration
Task	What titrant is used in bromatometry?
Correct answer	$K\,BrO_3$
B	$K\,Br$
C	Br_2
D	$K\,BrO_4 + K\,C\,l$
E	$K\,BrO_4$
№	krok 2016
Topic	Analysis of cations of I-III analytical groups
Task	During reaction of silver cations identification first $H\,C\,l$ and then ammonia solution have been added to the solution. What compound was produced as the result?
Correct answer	$[Ag\,(N\,H_3)_2]C\,l$
B	$[Ag_2(N\,H_3)_3]C\,l$
C	$AgOH$
D	$AgC\,l$
E	$[Ag\,(N\,H_3)_3]C\,l$
№	krok 2016
Topic	Analysis of anions
Task	In a chemical analytical laboratory a chemist investigates a solution of anion mixture. When antipyrin solution is added it colors emerald-green. This analytical effect signifies presence of the following anions:

Correct answer	Nitrite
B	Nitrate
C	Acetate
D	Tartrate
E	Citrate
№	krok 2016, 2013
Topic	Oxidation-reducing titration
Task	Specify the standard solutions that are used in permanganatometry to quantify the oxidants by means of back titration:
Correct answer	Potassium permanganate, iron (II) sulfate
B	Potassium dichromate, sodium thiosulfate
C	Potassium bromate, sodium thi-osulfate
D	Potassium iodate, sodium thi-osulfate
E	Cerium (IV) sulfate, iron (II) sulfate
№	krok 2016
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	What indicator is used to fix the endpoint of mercurimetric titration?
Correct answer	Thiocyanate complexes of iron (III)
B	Fluorescein
C	Eosin
D	Murexide
E	Potassium chromate
№	krok 2016
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	The Volhard method is used to define mass concentration of sodium chloride. Name the titrant of this method:
Correct answer	Ammonium thiocyanate

B	Mercury (I) nitrate
C	Sodium tetraborate
D	Mercury (II) nitrate
E	Sodium hydroxide
№	krok 2016, 2015
Topic	Analysis of anions
Task	What anion of the 2nd analytic group produces black precipitate with the group reagent $AgNO_3$?
Correct answer	S^{2-}
B	I^-
C	Cl^-
D	Br^-
E	NCS^-
№	krok 2016
Topic	Analysis of cations of I-III analytical groups
Task	Specify the reagent allowing to determine barium cations in the presence of calcium and strontium cations:
Correct answer	Potassium dichromate
B	Potassium chloride
C	Potassium iodide
D	Potassium nitrate
E	Sodium hydroxide
№	krok 2016
Topic	Analysis of cations of I-III analytical groups

Task	An analytical chemist performs qualitative analysis of cations of the II analytical group. The following solution is used to separate silver and mercury chlorides:
Correct answer	Ammonia
B	Hydrochloric acid
C	Sodium hydroxide
D	Sodium nitrate
E	Potassium chloride
№	krok 2016
Topic	Analysis of cations of I-III analytical groups
Task	Burner’s flame colors carminered in the presence of salts of an unknown cation. Name this cation:
Correct answer	Strontium
B	Ammonium
C	Sodium
D	Potassium
E	Iron
№	krok 2015, 2011
Topic	Oxidation-reducing titration
Task	Specify the standard solution (titrant) for the iodometric determination of oxidants:
Correct answer	$Na_2S_2O_3$
B	$KMnO_4$
C	I_2
D	$K_2Cr_2O_7$
E	$KBrO_3$
№	krok 2015, 2012
Topic	Analysis of cations of I-III analytical groups

Task	In the qualitative analysis which involves precipitation of sulphates of the third analytical group cations (Ca^{2+}, Sr^{2+}, Ba^{2+}) the solubility of sulphates can be reduced by adding:
Correct answer	Ethyl alcohol
B	Distilled water
C	Benzene
D	Chloroform
E	Amyl alcohol
№	krok 2015
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	What standard solution (titrant) is used in Folgard's direct titration method?
Correct answer	Ammonium thiocyanate
B	Sodium chloride
C	Silver nitrate
D	Potassium chromate
E	Potassium dichromate
№	krok 2015
Topic	Analysis of anions
Task	What anions form brown ring with iron (II) salts in the presence of concentrated sulfuric acid?
Correct answer	Nitrate ions
B	Acetate ions
C	Bromate ions
D	Citrate ions
E	Thiocyanate ions
№	krok 2015

Topic	Gravimetry. Acid-basic titration.
Task	Specify the precipitating agent to be used in gravimetric determination of calcium salts:
Correct answer	$(NH_4)_2C_2O_4$
B	$K_2C_2O_4$
C	$Na_2C_2O_4$
D	Na_2CO_3
E	K_2CO_3
№	krok 2015, 2012
Topic	Precipitating titration. Complexometer. Physico-chemical methods of analysis.
Task	To identify a drug by thin-layer chromatography the following parameter is used:
Correct answer	R_f
B	n
C	E, mV
D	I, A
E	K_p
№	krok 2015
Topic	Precipitating titration. Complexometer. Physico-chemical methods of analysis.
Task	To determine sodium iodide with Fajans method the following indicator is required:
Correct answer	Eosin
B	Methyl-orange
C	Diphenylcarbazone
D	Potassium chromate
E	Iron ammonium alum
№	krok 2015
Topic	Analysis of cations of I-III analytical groups

Task	In the process of silver cations identification reaction HCl and then ammonia solution have been added to the solution. What compound has been produced as a result?
Correct answer	$[Ag(NH_3)_2]Cl$
B	$[Ag_2(NH_3)_3]Cl$
C	Ag
D	$AgCl$
E	$[Ag(NH_3)_3]Cl$
№	krok 2015
Topic	Analysis of anions
Task	In a chemico-analytical laboratory a dispensing chemist studies the solution of anion mixture. When antipyrin solution is added to the solution, it becomes emerald-green in colour. This analytical effect signi-fies presence of the following anions:
Correct answer	Nitrite
B	Nitrate
C	Acetate
D	Tartrate
E	Citrate
№	krok 2015
Topic	Oxidation-reducing titration
Task	Specify the standard solutions that are used in permanganatometric titration to quantify the oxidants by the residual titration method:
Correct answer	Potassium permanganate, iron (II) sulfate
B	Potassium dichromate, sodium thi-osulfate
C	Potassium bromate, sodium thiosulfate
D	Potassium iodate, sodium thiosulfate

E	Cerium (IV) sulfate, iron (II) sulfate
№	krok 2015, 2013
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	What indicator is used for fixing the endpoint of mercurimetric titration?
Correct answer	Thiocyanate complexes of iron (III)
B	Fluorescein
C	Eosin
D	Murexide
E	Potassium chromate
№	krok 2015
Topic	Gravimetry. Acid-basic titration.
Task	Mass fraction of Fe^{2+} ions in Mohr's salt can be determined by gravimetric sedi-mentation method using:
Correct answer	NH_4OH
B	Na_2S
C	K_3PO_4
D	$BaCl_2$
E	$ZnCl_2$
№	krok 2015, 2012
Topic	Analysis of anions
Task	Silver nitrate solution has been added to the solution containing anions of the fi-rst analytical group. It resulted in yellow precipitate. That means the following are present in the solution:
Correct answer	Arsenite ions
B	Arsenate ions
C	Sulphate ions

D	Iodide ions
E	Bromide ions
№	krok 2015
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	The Volhard method is used to determine sodium chloride mass concentration. Name the titrant of this method:
Correct answer	Ammonium thiocyanate
B	Mercury (I) nitrate
C	Sodium tetraborate
D	Mercury (II) nitrate
E	Sodium hydroxide
№	krok 2015
Topic	Oxidation-reducing titration
Task	Mass fraction of pharmaceutical preparations that contain aromatic ami-no groups is determined through nitrite titration. What external indicator is used in this case?
Correct answer	Starch-iodide paper
B	Methylene red
C	Eriochrome Black T
D	Phenolphthalein
E	Eosin
№	krok 2015
Topic	Analysis of cations of I-III analytical groups
Task	Microcrystalloscopic reactions of potassium ions detection include the reaction with:
Correct answer	Sodium lead hexanitrocuprate (II)
B	Sodium hydrotartrate
C	Sodium hexanitrocobaltate
D	Sodium tetraphenylborate

E	Flame test
№	krok 2015
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis
Task	Fajans titration with fluorescein is performed within the following pH range of a medium:
Correct answer	pH 7-10
B	pH 12
C	pH 2
D	pH 4-6
E	pH 12
№	krok 2015
Topic	Analysis of cations of IV-VI analytical groups
Task	What cations of the V analytical group can be detected by hydrolysis?
Correct answer	Antimony and bismuth
B	Manganese
C	Iron (II)
D	Magnesium
E	Iron (III)
№	krok 2015
Topic	Analysis of anions
Task	A solution of magnesium mixture was added into solution with anions of the 1st analytical group. White crystalline precipi-tate was produced. What anions cause such analytical effect?
Correct answer	PO_4^{3-} and AsO_4^{3-}
B	AsO_3^{3-}
C	$S_2O_3^{2-}$

D	SO_3^{2-}
E	$C_2O_4^{2-}$
№	krok 2015
Topic	Analysis of anions
Task	To detect anions in a solution by fractional method a reaction with iron (III) chloride was performed in acid medium. The solution coloured red-violet. What anion is the cause of such analytical effect?
Correct answer	Salicylate
B	Chloride
C	Nitrate
D	Bromate
E	Phosphate
№	krok 2015
Topic	Analysis of cations of IV-VI analytical groups
Task	Sodium hydroxide was added to a solution. Precipitation occurred. The precipitate was initially white and became brown later. It indicates the presence of the following in the solution:
Correct answer	Manganese (II) cations
B	Lead (II) cations
C	Potassium cations
D	Calcium cations
E	Barium cations
№	krok 2015
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Determination of silver salts by ammonium thiocyanate titration is performed in the presence of the following indicator:

Correct answer	$(NH_4)Fe(SO_4)_2$
B	$FeSO_4$
C	$FeCl_2$
D	$(NH_4)_2SO_4$
E	NH_4SCN
№	krok 2015
Topic	Analysis of cations of I-III analytical groups
Task	Specify the parameters that characterize the sensitivity of analytical reaction:
Correct answer	All the parameters
B	Minimal volume of borderline diluted solution
C	Borderline dilution
D	Absolute sensitivity
E	Borderline concentration
№	krok 2014
Topic	Analysis of cations of IV-VI analytical groups
Task	Potassium iodide solution has been added to the solution containing cations of the sixth analytical group (acid-base classification). It resulted in red precipitate soluble in excess of reagent. What cations are present in the solution?
Correct answer	Mercury (II)
B	Nickel
C	Cobalt (II)
D	Bismuth
E	Cadmium
№	krok 2014
Topic	Precipitating titration. Complexometer. Physico-chemical methods of analysis

Task	The Mohr method is used to define sodium chloride mass concentration in isotonic solution. Titration is carried out with the following indicator present:
Correct answer	Potassium chromate
B	Fluorescein
C	Ammonium iron (III) sulfate
D	Diphenylcarbazone
E	Ferroin
№	krok 2014
Topic	Analysis of cations of IV-VI analytical groups
Task	Cations Cu^{2+}, Co^{2+}, Ni^{2+}, Cd^{2+}, Hg^{2+} belong to the sixth group of cations. What is the group reagent for the sixth group of cations?
Correct answer	Excess of NH_3
B	Solution of H_2SO_4
C	Solution of $NaOH$
D	Excess of KOH solution
E	Solution of HCl
№	krok 2014
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	What analytical effect is observed when titration end point in the Volhard method is registered?
Correct answer	Red coloration of solution
B	Red precipitate
C	Yellow coloration of solution
D	Brown precipitate
E	Yellow precipitate
№	krok 2014

Topic	Analysis of cations of I-III analytical groups
Task	What reagent is used to separate $AgCl$ precipitate from AgI precipitate?
Correct answer	Aqueous solution of ammonia
B	Concentrated nitric acid
C	Diluted nitric acid
D	Concentrated solution of potassium chloride
E	Sulfuric acid solution
№	krok 2014
Topic	Analysis of anions
Task	Nitrite ions can be detected in the presence of nitrate ions using the following:
Correct answer	Crystalline antipyrine in the presence of diluted $H\ Cl$
B	Crystalline sodium thiosulfate
C	Dimethylglyoxime
D	Crystalline iron (III) sulfate
E	Diphenylcarbazone
№	krok 2014
Topic	Analysis of cations of I-III analytical groups
Task	How to separate $PbSO_4$ from mixture of the 3rd analytical group cation sulphates in the process of systematic analysis?
Correct answer	Processing precipitate with 30% ammonium acetate solution
B	Precipitate recrystallization
C	Processing precipitate with concentrated sulfate acid
D	Processing precipitate with acetate acid solution
E	Processing precipitate with ammonia solution
№	krok 2014
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.

Task	Gas chromatography has been used for ethanol quantitative determination. What parameter is measured?
Correct answer	Chromatographic peak height or area
B	Retention time
C	Retention volume
D	Chromatographic peak width
E	Chromatographic peak half-width
№	krok 2014
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	The following parameter is used in thin-layer chromatography to identify pharmaceutical composition:
Correct answer	R_f
B	n
C	E, mV
D	I, A
E	K
№	krok 2014
Topic	Analysis of cations of I-III analytical groups
Task	Why is ethyl alcohol used along with the group reagent of the third analytical group?
Correct answer	To ensure full precipitation of all cations of this group
B	To further dissolve obtained precipi-tate
C	For fractional precipitation of cati-ons
D	To change pH of medium
E	To prevent complexing
№	krok 2014
Topic	Analysis of cations of I-III analytical groups

Task	In the process of silver cations identification reaction HCl and then ammonia solution have been added to the solution. What compound has been produced as a result?
Correct answer	$[Ag(NH_3)_2]Cl$
B	$[Ag_2(NH_3)_3]Cl$
C	$AgOH$
D	$AgCl$
E	$[Ag(NH_3)_3]Cl$
№	krok 2014
Topic	Analysis of cations of IV-VI analytical groups
Task	In chemico-analytical laboratory a specialist studies the mixture of the 5th analytical group cations. When thiocyanate ions are added the solution becomes red-colored. This analytical effect indicates presence of the followi-ng cation:
Correct answer	Fe^{3+}
B	Fe^{2+}
C	Mg^{2+}
D	Bi^{3+}
E	Mn^{2+}
№	krok 2014
Topic	Oxidation-reducing titration
Task	Dispensing chemist conducts quantitative determination of pharmaceutical substance with restorative properties through direct bromate titration. What solution is the titrant?
Correct answer	Potassium bromate
B	Iodine solution in potassium iodide

C	Sodium thiosulfate
D	Potassium iodide
E	Chloride acid
№	krok 2014
Topic	Analysis of anions
Task	In the chemico-analytical laboratory the dispensing chemist studies solution of anion mixture. When antipyrin solution is added it becomes emerald-green colored. This analytical effect signifies presence of the following anions:
Correct answer	Nitrite
B	Nitrate
C	Acetate
D	Tartrate
E	Citrate
№	krok 2014
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	What compound is added along with murexide indicator when detecti-ng calcium cations in order to reach pH>12?
Correct answer	Sodium hydroxide
B	Acetate buffer
C	Urotropin
D	Ammoniac buffer
E	Ammonium hydroxide
№	krok 2014, 2012
Topic	Analysis of cations of I-III analytical groups
Task	Ammonia solution has been added to the solution being studied. Black precipitate has formed. That means the following cations are present in the solution:
Correct answer	Mercury (I)

B	Copper (II)
C	Iron (III)
D	Iron (II)
E	Silver (I)
№	krok 2014
Topic	Analysis of anions
Task	Silver nitrate solution has been added to the solution containing anions of the first analytical group. It resulted in yellow precipitate. That means the following are present in the solution:
Correct answer	Arsenite ions
B	Arsenate ions
C	Sulphate ions
D	Iodide ions
E	Bromide ions
№	krok 2014
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	The Volhard method is used to define sodium chloride mass concentration. Name titrant of this method.
Correct answer	Ammonium thiocyanate
B	Mercury (I) nitrate
C	Sodium tetraborate
D	Mercury (II) nitrate
E	Sodium hydroxide
№	krok 2014
Topic	Oxidation-reducing titration
Task	Mass fraction of pharmaceutical preparations that contain aromatic amino groups is defined through nitrite titration. What external indicator is used in this case?

Correct answer	Starch-iodide paper
B	Methylene red
C	Eriochrome Black T
D	Phenolphthalein
E	Eosin
№	krok 2014
Topic	Analysis of cations of IV-VI analytical groups
Task	Chemist-analyst should use the following reaction to detect chromium (III) ions during preliminary tests:
Correct answer	Reaction of peroxochromate acid formation after previous chromium oxidation
B	Apply sodium hydroxide
C	Apply potassium permanganate
D	Apply ammonia
E	Apply sodium hydroxide and hydrogen peroxide
№	krok 2014
Topic	Analysis of anions
Task	Identical analytical effect is observed when NO_3^- and NO_2^- ions interact with:
Correct answer	Diphenylamine and concentrated H_2SO_4
B	Solution of $KMnO_4$
C	Solution of I_2 y KI
D	Solution of $AgNO_3$
E	Solution of $BaCl_2$
№	krok 2014
Topic	Analysis of anions
Task	What anion of the 2nd analytic group produces black precipitate with group reagent $AgNO_3$?

Correct answer	S^{2-}
B	I^{-}
C	Cl^{-}
D	Br^{-}
E	$N\,CS^{-}$
№	krok 2014
Topic	Analysis of anions
Task	Group reagent of the second analytical group anions (Cl^{-},Br^{-},I^{-}, S^{2-}) is the solution of $AgN\,O_3$ with the addition of the following substance:
Correct answer	Nitric acid
B	Hydrobromic acid
C	Acetic acid
D	Hydrochloric acid
E	Hydrosulphuric acid
№	krok 2014
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	What particles of the micelle described by the following formula: {m(AgCl) nAg+ (n − x) N O3−}x+ xN O3− are situated in diffusion layer?
Correct answer	$N\,O_3^{-}$
B	$AgCl$
C	Ag^{+}
D	$AgCl$ and Ag^{+}
E	Ag^{+} and $N\,O_3^{-}$
№	krok 2013

Topic	Analysis of cations of IV-VI analytical groups
Task	An excess of concentrated ammonium hydroxide is a group reagent for the cations of the VI analytical group (acid-base classification), namely Co^{2+}, Ni^{2+}, Cd^{2+}, Cu^{2+}, Hg^{2+}. As a result of this reaction the following substances are formed:
Correct answer	Water-soluble ammonia complexes
B	Hydroxides of acid-soluble cations
C	Stained water-insoluble compounds
D	Hydroxides of alkali-soluble cations
E	Hydroxides of the cations insoluble in the excess of ammonium hydroxide
№	krok 2013
Topic	Analysis of cations of IV-VI analytical groups
Task	A solution contains cations of zinc and aluminium. Specify the reagent that makes it possible to detect cations of zinc in this solution:
Correct answer	Potassium hexacyanoferrate (II) solution
B	Sodium hydroxide solution
C	Cobalt nitrate $Co(NO_3)_2$
D	Excess of 6M sodium hydroxide in presence of hydrogen peroxide
E	Sulfuric acid solution
№	krok 2013
Topic	Gravimetry. Acid-basic titration.
Task	A medicament comprises sodium bi-carbonate and sodium chloride. What method is used for quantitative determi-nation of sodium bicarbonate?
Correct answer	Acid-base titration
B	Precipitation titration
C	Redox titration
D	Complexometric titration

E	Coulometric titration
№	krok 2013
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Concentration of magnesium sulfate in a drug can be determined by complexometric titration. Select an indicator for fixing the end point of titration:
Correct answer	Chromogen black
B	Phenolphtalein
C	Methyl orange
D	Diphenylcarbazone
E	-
№	krok 2013
Topic	Oxidation-reducing titration
Task	The mass percentage of ascorbic acid can be determined by the cerimetric analysis in the presence of the following redox indicator:
Correct answer	Ferroin
B	Methylene red
C	Eosin
D	Fluorescein
E	Methylene orange
№	krok 2013
Topic	Oxidation-reducing titration
Task	Specify the standard solution for the iodometric determination of reducing agents (direct titration):
Correct answer	I_2
B	$KMnO_4$
C	$Na_2S_2O_3$

D	$K_2Cr_2O_7$
E	KI
№	krok 2013
Topic	Analysis of cations of IV-VI analytical groups
Task	The fourth group of cations includes the cations Al^{3+}, Sn^{2+}, $Sn(IV)$, $As(V)$, $As(III)$, Zn^{2+}, C^{3+}. The group reagent for the fourth group of cations is the solution of:
Correct answer	$NaOH$, H_2O_2
B	HCl
C	NH_3, H_2O_2
D	$H_2C_2O_4$
E	H_2SO_4, H_2O_2
№	krok 2013
Topic	Analysis of cations of IV-VI analytical groups
Task	In a qualitative analysis, when an excess of the group reagent (NH_3 soluti-on) reacts with the cations of the sixth analytical group (Cu^{2+}, Co^{2+}, Ni^{2+}, Cd^{2+}, Hg^{2+}), the following compounds are formed:
Correct answer	Metal ammine complexes
B	Metal hydroxides
C	Basic metal salts
D	Aqua complexes of metals
E	Hydroxocomplexes of metals
№	krok 2013
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	What analytical effect is observed after fixing the endpoint during the titration by Mohr method?

Correct answer	Brick-red precipitate
B	Red colour of solution
C	Yellow colour of solution
D	White precipitate
E	Yellow precipitate
№	krok 2013, 2012
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	What solution can be determined by photocolorimetric method by self-absorbance?
Correct answer	Potassium chromate
B	Potassium chloride
C	Potassium sulphate
D	Potassium nitrate
E	Potassium phosphate
№	krok 2013
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	What substance in a solution can be determined in two ways - by the polarimetric or refractometric method?
Correct answer	Ascorbic acid
B	Sodium benzoate
C	Benzoic acid
D	Calcium gluconate
E	Magnesium sulfate
№	krok 2013
Topic	Gravimetry. Acid-basic titration.
Task	What titrants are used for the titration in the non-aqueous medium?
Correct answer	Perchloric acid and sodium ethylate
B	Sulfuric acid and barium hydroxide

C	Hydrochloric acid and potassium ethylate
D	Nitric acid and sodium hydroxide
E	Perchloric acid and barium hydroxide
№	krok 2013
Topic	Analysis of cations of IV-VI analytical groups
Task	What reagents are used to separate the cations of the IV analytical group from the cations of the V and VI analytical groups in the analysis of their composition?
Correct answer	$NaOH$ and H_2O_2
B	H_2SO_4
C	*Dithizone*
D	NH_4OH
E	Na_2S
№	krok 2013
Topic	Gravimetry. Acid-basic titration.
Task	Specify the standard substance for the standardization of 0,1 M of hydrochloric acid solution:
Correct answer	Sodium carbonate
B	Ammonium hydroxide
C	Oxalic acid
D	Sodium chloride
E	Zinc sulphate
№	krok 2013
Topic	Analysis of cations of I-III analytical groups
Task	A ground for separating lead (II) chloride from the other chlorides of the II analytical group (acid-base classification) is its different solubility in:
Correct answer	Hot water

B	Hydrochloric acid
C	Alkalis
D	Ammonia solution
E	Sulfuric acid
№	krok 2013
Topic	Analysis of cations of IV-VI analytical groups
Task	At a chemical analytical laboratory, a technician examines a solution of the VI analytical group cations. After the additi-on of ammonium thiocyanate and amyl alcohol, the organic layer turned blue. What cation is present in the solution?
Correct answer	Co^{2+}
B	Ni^{2+}
C	Cu^{2+}
D	Hg^{2+}
E	Cd^{2+}
№	krok 2013
Topic	Precipitating titration. Complexime-ter. Physico-chemical methods of analysis.
Task	An analytical chemist determines sodium cations by ion-exchange chromatography. In order to prepare the cation-exchange resin in the H^{+} form, the analyst uses:
Correct answer	HCl
B	CH_3COOH
C	C_2H_5OH
D	H_3PO_4
E	CH_3OH
№	krok 2013
Topic	Analysis of cations of I-III analytical groups

Task	To isolate the lead (II) chloride from the other cations of the II analytical group in the systematic analysis, the chloride precipitate should be processed with:
Correct answer	Hot water
B	Ammonia solution
C	Nitric acid solution
D	Acetate acid solution
E	Alkali solution
№	krok 2013
Topic	Analysis of cations of IV-VI analytical groups
Task	What reagent is used to separate the cations of copper (II) and mercury from the other cations of the VI analytical group?
Correct answer	Sodium thiosulfate
B	Sodium sulfate
C	Bromine water
D	Potassium sulfide
E	Excess of the concentrated ammonia solution
№	krok 2013
Topic	Oxidation-reducing titration
Task	Permanganometric titration of hydrogen peroxide is carried out in the following medium:
Correct answer	Sulfate
B	Alkaline
C	Nitrate
D	Hydrochloric
E	Alcohol
№	krok 2013, 2012
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.

Task	Quantitative analysis of zinc salts is performed by method of trilonometry. What indicator is used for this purpose?
Correct answer	Eriohrome black T
B	Phenolphtalein
C	Methyl black
D	Potassium dichromate
E	Thymol blue
№	krok 2012
Topic	Analysis of cations of IV-VI analytical groups
Task	An excess of concentrated ammonium hydroxide is a group reagent for the cations of the VI analytical group (acid-base classification) Co^{2+}, Ni^{2+}, Cd^{2+}, Cu^{2+}, Hg^{2+}. In this case the following substances are formed:
Correct answer	Water-soluble ammonia complexes
B	Hydroxides of acid-soluble cations
C	Stained, water-insoluble compounds
D	Hydroxides of alkali-soluble cations
E	Hydroxides of the cations insoluble in the excess of ammonium hydroxide
№	krok 2012
Topic	Oxidation-reducing titration
Task	Both external and internal indicators are used in the following titrimetric method of analysis
Correct answer	Nitritometry
B	Alkalimetry
C	Chelatometry
D	Permanganatometry
E	Argentometry

№	krok 2012
Topic	Gravimetry. Acid-basic titration.
Task	What indicator is used for the quantitative determination of sodium carbonate in a preparation by the method of acid-base titration?
Correct answer	Methyl orange
B	Murexide
C	Methylene blue
D	Diphenylamine
E	Ferroin
№	krok 2012
Topic	Analysis of cations of I-III analytical groups
Task	The solid residue obtained after evaporation of the sample solution makes the colorless flame of burner turn yellow, and when watched through a blue glass, it looks purple. What cations are present in the solid residue?
Correct answer	Na^{+}, K^{+}
B	Ca^{2+}, K^{+}
C	Na^{+}, Sr^{2+}
D	Li^{+}, Ba^{2+}
E	Na^{+}, Ca^{2+}
№	krok 2012
Topic	Analysis of cations of IV-VI analytical groups
Task	A solution contains cations of zinc and aluminum. Specify the reagent that allows to detect cations of zinc in this solution:
Correct answer	Potassium hexacyanoferrate (II) solution
B	Sodium hydroxide solution

C	Cobalt nitrate $Co(NO_3)_2$
D	Excess of 6M sodium hydroxide in presence of hydrogen peroxide
E	Sulfuric acid solution
№	krok 2012
Topic	Analysis of cations of IV-VI analytical groups
Task	In a solution containing cations of copper (II) and zinc, the copper cations can be identified by means of the excess of the following reagent:
Correct answer	6M ammonia solution
B	2M sulfuric acid solution
C	6M potassium hydroxide solution
D	2M hydrochloric acid solution
E	2M solution of ammonium carbonate
№	krok 2012
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	Concentration of magnesium sulfate in a drug can be determined by complexometric titration. Choose an indicator to detect the end point of titration:
Correct answer	Chromogen black
B	Phenolphtalein
C	Methyl orange
D	Eosin
E	-
№	krok 2012
Topic	Analysis of cations of I-III analytical groups
Task	The ability of reagent to ensure a stable analytical effect in the interaction with the analyzed substance is characterized by:
Correct answer	Reaction sensitivity

B	Reaction selectivity
C	Reaction specificity
D	Reagent amount
E	-
№	krok 2012
Topic	Oxidation-reducing titration
Task	The conversion $MnO_4^- \rightarrow MnO_2$ represents the following reaction:
Correct answer	Reduction in neutral medium
B	Oxidation in acidic medium
C	Reduction in acidic medium
D	Oxidation in alkaline medium
E	Reduction in alkaline medium
№	krok 2012
Topic	Precipitating titration. Complexometer. Physico-chemical methods of analysis.
Task	For the quantitative analysis of ethanol the gas chromatography was used. Which parameter was measured?
Correct answer	Peak height or area
B	Retention time
C	Retention volume
D	Peak width
E	Peak width at half height
№	krok 2012
Topic	Oxidation-reducing titration
Task	Potassium permanganate reacting with hydrogen peroxide in acidic medium acts as:
Correct answer	Oxidant
B	Reductant

C	Disproportionation agent
D	Oxidant and reductant
E	Does not act either as an oxidant, or as a reductant
№	krok 2012
Topic	Gravimetry. Acid-basic titration.
Task	Specify the colour of phenolphthalein in the sodium sulfide solution:
Correct answer	Crimson
B	Colourless
C	Blue
D	Yellow
E	Green
№	krok 2012
Topic	Oxidation-reducing titration
Task	What reactions are used in the methods of permanganatometry, dichromatometry, iodometry?
Correct answer	Oxidation-reduction
B	Precipitation
C	Complexation
D	Neutralization
E	Hydrolysis
№	krok 2012
Topic	Analysis of cations of I-III analytical groups
Task	In order to bind hydrogen ions during the identification of potassium ions with tartaric acid the following solution is used:
Correct answer	Sodium acetate
B	Sodium hydroxide
C	Ammonia

D	Sulfuric acid
E	Hydrochloric acid
№	krok 2012
Topic	Precipitating titration. Complexometer. Physico-chemical methods of analysis.
Task	A solution containing calcium and magnesium cations is titrated with Trilon B solution. Complexometric titration of these cations requires the following medium:
Correct answer	Ammonium buffer solution
B	Formate buffer solution
C	Neutral medium
D	Acidic solution
E	Acetate buffer solution
№	krok 2012
Topic	Analysis of anions
Task	Pharmacopoeia test reaction for determination of benzoate ions is the interaction with the following solution:
Correct answer	Iron (III) chloride
B	Potassium chloride
C	Resorcinol
D	Acetic anhydride
E	Diphenylamine
№	krok 2012
Topic	Precipitating titration. Complexometer. Physico-chemical methods of analysis.
Task	What working solutions (titrants) are used in the method of precipitation titration - Folgard method?
Correct answer	$AgNO_3$ and NH_4SCN
B	H_2SO_4 and $NaOH$

C	$Na_2S_2O_3$ and $K(I_3)$
D	$KMnO_4$ and $KBrO_3$
E	$HClO_4$ and KOH
№	krok 2012
Topic	Analysis of cations of IV-VI analytical groups
Task	In order to identify the cations of zinc (II) an analytical chemist used the reagent solution of hexacyanoferrate (II) potassium (Pharmacopeia reaction). What colour precipitate is formed in this reaction?
Correct answer	White
B	Yellow
C	Black
D	Green
E	Red
№	krok 2011, 2008
Topic	Analysis of anions
Task	For determination of nitrate ions diphenylamine was added to the solution under examination. The following changes were observed:
Correct answer	Generation of blue solution
B	Generation of yellow deposition
C	Generation of blue deposition
D	Generation of brown gas
E	Emergence of a typical smell
№	krok 2011, 2010
Topic	Oxidation-reducing titration
Task	Iodometric determination of formaldehyde in formaline can be done by the back titration. Iodine surplus is titrated with the standard solution of:

Correct answer	Sodium thiosulphate
B	Sodium nitrate
C	Sodium sulphate
D	Sodium carbonate
E	Sodium phosphate
№	krok 2011, 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	Filter paper impregnated with solution of cobalt (II) nitrate and a solution under examination forms blue ash when burned down. This is the evidence of presence of the following ions:
Correct answer	Al^{3+}
B	Cr^{3+}
C	Ni^{2+}
D	Sb^{3+}
E	Zn^{2+}
№	krok 2011, 2009
Topic	Analysis of cations of IV-VI analytical groups
Task	After a solution had been heated with $(NH_4)_2S_2O_8$ in presence of $AgNO_3$, it turned crimson. What ions were present in the solution?
Correct answer	Mn^{2+}
B	Fe^{3+}
C	Fe^{2+}
D	Co^{2+}
E	Cu^{2+}

№	krok 2011, 2009
Topic	Analysis of anions
Task	A solution under examination was added to the solution of $FeSO_4$ in presence of concentrated H_2SO Formation of a brown ring indicates presence of:
Correct answer	Nitrate ions
B	Acetate ions
C	Carbonate ions
D	Oxalate ions
E	Phosphate ions
№	krok 2011, 2009
Topic	Analysis of cations of I-III analytical groups
Task	1M sulphuric acid solution was added to the solution under study. This resulted in formation of white sediment that was soluble in the alkalies. This indicated that the solution contains:
Correct answer	Plumbum cations
B	Calcium cations
C	Barium cations
D	Argentum cations
E	Mercury (I) cations
№	krok 2011
Topic	Analysis of cations of IV-VI analytical groups
Task	A solution contains cations of zinc and aluminum. Specify the reagent that enables to detect cations of zinc in this solution
Correct answer	Potassium hexacyanoferrate (II) solution
B	Sodium hydroxide solution
C	Cobalt nitrate $Co(NO_3)_2$

D	The excess of 6M sodium hydroxide in presence of hydrogen peroxide
E	Sulfuric acid solution
№	krok 2011, 2010, 2009
Topic	Oxidation-reducing titration
Task	Specify the standardized solutions used for direct and back titration of reducing agents in the iodometric method:
Correct answer	I_2, $Na_2S_2O_3$
B	$K_2Cr_2O_7$, $Na_2S_2O_3$
C	I_2, KI
D	$KMnO_4$, KI
E	$K_2Cr_2O_7$, I_2
№	krok 2011
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	What kind of standard solution (titrant) is used according to Folgard's direct titration method?
Correct answer	Ammonium thiocyanate
B	Sodium chloride
C	Silver nitrate
D	Potassium chromate
E	Potassium dichromate
№	krok 2011, 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	Presence of which ion of d-elements in the solutions can be detected by means of K4[Fe(CN)6]?
Correct answer	Fe^{3+}
B	Fe^{2+}

C	Zn^{2+}
D	Cr^{3+}
E	Cu^{2+}
№	krok 2011
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Temporary hardness of water is caused by presence of the following calcium and magnesium salts in the natural water:
Correct answer	Hydrogen carbonate
B	Sulfates
C	Chlorides
D	Nitrates
E	Phosphates
№	krok 2011
Topic	Oxidation-reducing titration
Task	Potassium dichromate $K_2Cr_2O_7$ is applied as an oxidant in acidic medium. What is the product of reduction of dichromateion $Cr_2O_7^{2-}$ under these conditions?
Correct answer	Cr^{3+}
B	$Cr(OH)_3$
C	$Cr(OH)_2$
D	$[Cr(OH)_6]^{3-}$
E	Cr_2O_3
№	krok 2011
Topic	Oxidation-reducing titration
Task	Iodimetry involves use of standard solutions of iodine and $Na_2S_2O_3$. What substance is used to standardize the sodium thiosulfate solution?

Correct answer	$K_2Cr_2O_7$
B	$NaCl$
C	$N_2B_4O_7$
D	K_2CO_3
E	As_2O_3
№	krok 2011, 2010
Topic	Oxidation-reducing titration
Task	It is required to determine the amount of sodium salicylate in a solution. What titrimetric method can be applied for the quantitative determination of aromatic compounds?
Correct answer	Bromometry
B	Mercurimetry
C	Cerimetry
D	Argentometry
E	Chelatometry
№	krok 2011, 2008
Topic	Analysis of anions
Task	Analytical indication of effect of potassium iodide solution upon unstained oxidizing anions in presence of chloroform is:
Correct answer	Brown stain of free iodine
B	Settling down of white deposition
C	Change of aggregate state
D	Emission of gas bubbles
E	Origination of deposition and its solution in reagent excess
№	krok 2011, 2009
Topic	Analysis of anions

Task	Choose the reagents for detection of the sulphate ions in a solution containing carbonate, sulphate and phosphate ions:
Correct answer	$Ba(NO_3)_2$, HCl
B	$Ba(NO_3)$, $NaOH$
C	$BaCl_2$, H_2O
D	$CaCl_2$, NH_4OH
E	$AgNO_3$, HNO_3
№	krok 2011, 2010
Topic	Gravimetry. Acid-basic titration.
Task	Choose a pair of titrants for the qualitative determination of ammonia in a solution by the method of back titration:
Correct answer	HCl, $NaOH$
B	HCl, H_2SO_4
C	KOH , $NaOH$
D	$NaOH$, KCl
E	H_2SO_4, K_2SO_4
№	krok 2011
Topic	Analysis of cations of IV-VI analytical groups
Task	The analytical effect of reaction of potassium hexacyanoferrate (II) solution with iron (III) ions is:
Correct answer	Formation of blue precipitate
B	Formation of white precipitate
C	Formation of blue precipitate and its dissolution in the excess of the reagent
D	Effervescence
E	Characteristic smell
№	krok 2011, 2007

Topic	Oxidation-reducing titration
Task	Content of potassium dichromate in a solution was determined by iodometric method. Name the titrant of iodometric method for oxidant determination:
Correct answer	Sodium thiosulfate
B	Sodium hydroxide
C	Potassium iodide
D	Potassium permanganate
E	Potassium bromate
№	krok 2011
Topic	Analysis of cations of IV-VI analytical groups
Task	Perchromic acid formed as a result of chromium oxidation is unstable and dissolves in aqueous solutions. What solvent is used for its extraction?
Correct answer	Isoamyl alcohol and ether
B	Chloroform
C	Benzene
D	Nitrobenzene
E	Ethanol
№	krok 2011, 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	A solution containing the cations of the V analytic group (acid-base classification) has been taken for the analysis. The solution of sodium hydroxostannite has been added to the composition which resulted in formation of black deposition. This is the evidence of presence of the following cation:
Correct answer	Bi^{3+}
B	Fe^{2+}
C	Sb^{3+}

D	Fe^{3+}
E	Mg^{2+}
№	krok 2011
Topic	Analysis of cations of I-III analytical groups
Task	During identification of an unknown salt the colorless part of the burner flame turned yellow and green. What cation was the salt formed by?
Correct answer	Ba^{2+}
B	Ca^{2+}
C	Sr^{2+}
D	Na^{+}
E	K^{+}
№	krok 2011
Topic	Analysis of cations of I-III analytical groups
Task	A pharmaceutical analyst has to identify potassium acetate. He can prove the presence of potassium cation in the analyzed substance by means of the following solution:
Correct answer	Tartrate acid
B	Sodium hydroxide
C	Potassium permanganate
D	Iron (III) chloride
E	Formate acid
№	krok 2011
Topic	Analysis of cations of I-III analytical groups
Task	Reaction of a group reagent with the cations of the 2nd analytical group results in precipitation of $PbCl_2$ which can be dissolved in:

Correct answer	Hot water
B	0,2 M solution of sodium carbonate
C	Saturated solution of sodium carbonate
D	2M sulfuric acid solution
E	Ethanol
№	krok 2011
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	Mass fraction of Fe^{2+} ions in Mohr's salt can be determined by gravimetric sedimentation method using:
Correct answer	NH_4OH
B	Na_2S
C	K_3PO_4
D	$BaCl_2$
E	$ZnCl_2$
№	krok 2010, 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	Dimethyl glyoxime entered into reaction with a solution that contained cations of the IV analytical group (acid-base classification). The deposition turned crimson. What cation caused this analytical effect?
Correct answer	Nickel cation (II)
B	Mercury cation (II)
C	Copper cation (II)
D	Cadmium cation (II)
E	Cobalt cation (II)
№	krok 2010
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.

Task	Solution of Trilon B is the titrant in chelatometry. It makes complex compounds with metal cations irrespective of their valency with the following proportion:
Correct answer	1:01
B	1:03
C	1:02
D	2:01
E	3:01
№	krok 2010
Topic	Analysis of anions
Task	Sodium arsenate solution can be distinguished from the arsenite solution by means of the following reagent:
Correct answer	Magnesia mixture
B	Potassium sulphate
C	Potassium nitrate
D	Sodium chloride
E	Sodium fluoride
№	krok 2010
Topic	Oxidation-reducing titration
Task	Qualitative determination of the following compound is accompanied by blue stain of the ether layer:
Correct answer	H_2O_2
B	Cl_2
C	Na_2HPO_4
D	$MnSO_4$
E	$FeSO_4$
№	krok 2010

Topic	Analysis of anions
Task	A solution under examination was added to the solution of $FeSO_4$ in presence of concentrated H_2SO Formation of a brown ring indicates presence of:
Correct answer	Nitrate ions
B	Acetate ions
C	Carbonate ions
D	Oxalate ions
E	Phosphate ions
№	krok 2010
Topic	Analysis of anions
Task	A solution contaning anions of the second analytical group has been blended with the solution of argentum nitrate. This resulted in formation of black precipitate insoluble in the ammonia solution and soluble in the diluted nitric acid at heating. What anions are present in the solution?
Correct answer	Sulphide ions
B	Iodide ions
C	Chloride ions
D	Bromide ions
E	Arsenite ions
№	krok 2010
Topic	Oxidation-reducing titration
Task	0,1 M solution of potassium permanganate is used as a titrant in permanganatometry. The solution is prepared like the secondary standard solution and standardized according to:
Correct answer	Ammonia oxide
B	Potassium dichromate

C	Sodium chloride
D	Sodium carbonate
E	Calcium oxide
№	krok 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	During the qualitative analysis under the influence of group reagent $NaOH$ upon the aluminium ions the following substance is produced:
Correct answer	Sodium hexahydroxoaluminate
B	Aluminium hydroxide
C	Sodium metaaluminate
D	Basic aluminium salts
E	Aluminium oxide
№	krok 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	During analysis of cations of the IV analytic group Zn cations can be detected under certain conditions with the following reagent:
Correct answer	Dithizone
B	Ammonia solution
C	Alkali
D	Alkali metal carbonates
E	Dimethylglyoxime
№	krok 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	While detecting Co^{2+} ions in presence of Fe^{3+} the following ions should be added to the solution in order to mask Fe^{3+} ions:
Correct answer	Fluoride ions

B	Chloride ions
C	Bromide ions
D	Nitrite ions
E	Sulphate ions
№	krok 2010
Topic	Oxidation-reducing titration
Task	In oxidation-reduction reactions potassium permanganate $KMnO_4$ acts only as an oxidizer. When the reaction takes place in the acidic medium, the crimson solution becomes discoloured. Specify the product of MnO_4^- -ion reduction in the acidic medium:
Correct answer	Mn^{2+}
B	MnO_2
C	MnO_4^{2-}
D	$[Mn(OH)_2]$
E	$[Mn(OH)_4]$
№	krok 2010, 2009, 2008
Topic	Oxidation-reducing titration
Task	Potassium dichromate $K_2Cr_2O_7$ is applied as oxidant in acidic medium. What is the product of reduction of dichromateion $Cr_2O_7^{2-}$ under these conditions?
Correct answer	Cr^{3+}
B	$Cr(OH)_3$
C	$Cr(OH)_2$
D	$[Cr(OH)_6]^{3-}$
E	Cr_2O_3
№	krok 2010

Topic	Oxidation-reducing titration
Task	Choose a reduction-oxidation method for the quantitative determination of iron (II) salts in a solution that contains hydrochloric acid:
Correct answer	Dichromatometry
B	Iodometry
C	Permanganatometry
D	Nitritometry
E	Ascorbinometry
№	krok 2010
Topic	Gravimetry. Acid-basic titration.
Task	In order to choose an indicator during the acid-bace titration a titration curve is made which is the dependence of:
Correct answer	*pH* solution from the volume of the added titrant
B	*pH* solution from the concentration of the added titrant
C	*pH* solution from the volume of the solution under analysis
D	Concentration of the solution under analysis from *pH* solution
E	*pH* solution from the temperature
№	krok 2010, 2009
Topic	Gravimetry. Acid-basic titration.
Task	What method of titrimetric analysis can be applied for the quantitative determination of sulphuric acid by means of the potassium hydroxide solution?
Correct answer	Alkalimetry
B	Acidimetry
C	Oxidation-reduction
D	Precipitation
E	Complexation
№	krok 2010

Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis
Task	A composition under examination contains ions of *Cl* , *Br* and *I* in equimolar quantities. The sequence of precipitate formation in course of argentometric titration will be determined by:
Correct answer	Solubility product of the corresponding silver halogenides
B	Value of oxidation-reduction potentials
C	Way of titration - either back or direct
D	Value of corresponding ion mobility
E	Ionic strength of solution
№	krok 2010
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis
Task	Determination of sodium chloride by Folgard's method involves the following techniques:
Correct answer	Back titration, argentometry
B	Direct titration, argentometry
C	Substitute titration
D	Back titration, mercurimetry
E	Direct titration, mercurimetry
№	krok 2010
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis
Task	What substance can be identified by method of acid-base titration and oxidation-reduction titration?
Correct answer	Oxalate acid
B	Sodium sulphate
C	Calcium nitrate
D	Sodium hydroxide
E	Ammonium chloride

№	krok 2010
Topic	Analysis of cations of I-III analytical groups
Task	What cations relate to the I analytic group according to the acid-base classification?
Correct answer	Sodium, potassium, ammonium
B	Calcium, strontium, barium
C	Silver, lead, nickel
D	Aluminium, magnesium, zinc
E	Potassium, barium, bismuth
№	krok 2010
Topic	Analysis of cations of IV-VI analytical groups
Task	In course of the systematic analysis separation of cations of the V and VI analytic groups (according to the acid-base classification) is carried out under the action of excess of:
Correct answer	Concentrated ammonia solution
B	Sodium hydroxide solution
C	Hydrochloric acid solution
D	Potassium hydroxide solution
E	Sulphuric acid solution
№	krok 2009, 2008
Topic	Gravimetry. Acid-basic titration.
Task	A chemist in analytical laboratory needs to standardize solution of sodium hydroxide. What primary standard solution can be applied for this purpose?
Correct answer	Oxalic acid
B	Acetate acid
C	Chloride acid
D	Sodium tatraborate
E	Sodium chloride

№	krok 2009, 2008, 2007
Topic	Gravimetry. Acid-basic titration.
Task	Quantitative determination of pharmaceutical substances can be done by means of acidimetry. Its titrant is the secondary standard solution of hydrochloric acid. According to which compound the precise concentration of hydrochloric acid can be determined?
Correct answer	Sodium tetraborate
B	Oxalic acid
C	Potassium dichromate
D	Sodium thiosulfate
E	Magnesium sulphate
№	krok 2009
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Quantitative determination of calcium chloride is carried out by method of direct chelatometric titration. Choose an indicator for fixation of the titration endpoint:
Correct answer	Eriochrome black T
B	Phenolphthalein
C	Methyl red
D	Eosin
E	Starch
№	krok 2009
Topic	Gravimetry. Acid-basic titration.
Task	Specify standard substances used for standardization of titrant solutions ($NaOH$, KOH) in the alkalimetric method:
Correct answer	Oxalic and succinic acids
B	Acetic and succinic acids
C	Formic and acetic acids

D	Sulphanilic and oxalic acids
E	Sulphanilic and salicylic acids
№	krok 2009, 2007
Topic	Analysis of anions
Task	Argentum nitrate solution was added to a solution containing anions of the second analytical group. This resulted in formation of light-yellow sediment that was insoluble in the nitric acid and partly soluble in the ammonia solution. What anions were present in the solution?
Correct answer	Bromide ions
B	Iodide ions
C	Chloride ions
D	Sulphide ions
E	Arsenite ions
№	krok 2009
Topic	Analysis of cations of IV-VI analytical groups
Task	During the quantitative analysis carried out under the primary conditions, a specific reagent to Fe^{3+} cations is $K_4[Fe(CN)_6]$. Their interaction gives a precipitate of the following colour:
Correct answer	Blue
B	White
C	Brown
D	Red
E	Black
№	krok 2009
Topic	Gravimetry. Acid-basic titration.

Task	Specify the titration method, in which a standardized titrant solution is gradually added to the solution under study until a titration endpoint is reached:
Correct answer	Direct titration
B	Back titration
C	Indirect titration
D	Substitution titration
E	Residue titration
№	krok 2009
Topic	Analysis of cations of I-III analytical groups
Task	What saturated heated solution is used for transformation of sulphates $BaSO_4$, $SrSO_4$, $CaSO_4$ to carbonates during the systematic analysis?
Correct answer	Na_2CO_3
B	$CaCO_3$
C	$(NH_4)_2CO_3$
D	$MgCO_3$
E	CO_2
№	krok 2009
Topic	Oxidation-reducing titration
Task	Which indicatorless method enables quantitative determination of iron (II) content?
Correct answer	Permanganatometry
B	Chelatometry
C	Argentometry
D	Iodometry
E	Nitritometry
№	krok 2009
Topic	Oxidation-reducing titration

Task	It is required to determine amount of sodium salicylate in a solution. What titrimetric method can be applied for the quantitative determination of aromatic compounds?
Correct answer	Bromometry
B	Mercurimetry
C	Cerimetry
D	Argentometry
E	Chelatometry
№	krok 2009
Topic	Gravimetry. Acid-basic titration.
Task	In order to determine mass fraction of calcium in a pharmaceutical preparation, gravimetric method was applied. Ammonium oxalate solution was used as a precipitating agent. What is the gravimetric form in this case?
Correct answer	Calcium chloride
B	Anhydrous calcium oxalate
C	Monohydrous calcium oxalate
D	Calcium carbonate
E	Calcium hydroxide
№	krok 2009
Topic	Oxidation-reducing titration
Task	Specify the relevant indicators for fixation of the titration endpoint when using nitritometric method:
Correct answer	Tropeolin 00 + methylene blue
B	Methylene blue
C	Methylene orange
D	Starch solution
E	Diphenylamine
№	krok 2009

Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	During thin-layer chromatography of novocaine, the developed plate represented a stain 3 cm away from the start line, and the length of solvent front was 10 cm. What is the R_f value of novocaine?
Correct answer	0,3
B	0,4
C	0,5
D	0,6
E	0,7
№	krok 2009
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	What is the primary standard for standardization of $Hg_2(NO_3)_2$ solution?
Correct answer	Sodium chloride
B	Sodium bromide
C	Sosium sulphate
D	Sodium hydroxide
E	Sodium dichromate
№	krok 2009
Topic	Analysis of cations of I-III analytical groups
Task	After the diluted solution of hydrochloric acid had been added to the solution under examination, the white caseous precipitate settled down. This indicates presence of the following ions:
Correct answer	Silver
B	Ammonium
C	Iron (II)
D	Barium

E	Iodine
№	krok 2009
Topic	Analysis of cations of I-III analytical groups
Task	What analytical effect is observed when potassium cation is being determined by the sodium hexanitrocobaltate (III) solution?
Correct answer	Yellow crystalline precipitate
B	White crystalline precipitate
C	Yellow colouring of the solution
D	Black crystalline precipitate
E	Red crystalline precipitate
№	krok 2009, 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	A drug solution under examination contains cations of magnesium (II) and aluminium (III). Which reagent can help to separate these cations during analysis of this drug?
Correct answer	Alkali solution
B	Solution of hydrogen peroxide in acidic medium
C	Solution of silver nitrate
D	Ammonia solution
E	Solution of chloride acid
№	krok 2009
Topic	Gravimetry. Acid-basic titration.
Task	Quantitative determination of pharmaceutical substances can be carried out by method of alkalimetry using 0,1 M sodium hydroxide solution as a titrant. Precise concentration of sodium hydroxide can be determined according to:
Correct answer	Oxalic acid
B	Sodium tetraborate
C	Potassium dichromate

D	Sodium thiosulphate
E	Ammonium hydroxide
№	krok 2008
Topic	Analysis of cations of I-III analytical groups
Task	What reagent should be chosen in order to detect presence of Ca^{2+} cation in a solution?
Correct answer	$(NH_4)_2C_2O_4$
B	HCl
C	HNO_3
D	KCl
E	$NaBr$
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	What reaction is applied for detection of Fe^{3+} cation?
Correct answer	Complexing
B	Precipitation
C	Hydrolysis
D	Neutralization
E	Reduction
№	krok 2008
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	Thiocyanatometry is based upon using of secondary standard solution of potassium thiocyanate that should be standardized according to the following standard solution of:
Correct answer	Silver nitrate
B	Hydrochloric acid

C	Sulfuric acid
D	Iron (II) sulfate
E	Copper (II) nitrate
№	krok 2008
Topic	Oxidation-reducing titration
Task	Concentration of potassium dichromate in a solution was determined by means of iodometry. Name a titrant of iodometric method for determination of strong oxidizer:
Correct answer	Sodium thiosulfate
B	Sodium hydroxide
C	Potassium iodide
D	Potassium permanganate
E	Potassium bromate
№	krok 2008
Topic	Analysis of cations of I-III analytical groups
Task	Solution of potassium chromate was added to a solution under examination. As a result of it some yellow deposition settled down. This deposition cannot be dissolved in acetic acid. This means that the solution under examination contains cations of:
Correct answer	Barium
B	Calcium
C	Sodium
D	Cobalt
E	Magnesium
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups

Task	Qualitative reaction for determination of $Cr\,(V\,I\,)$ compounds is origination of chromium oxidediperoxide that stains ether layer with blue. What is formula of this chromium compound?
Correct answer	CrO_5
B	CrO_3
C	Cr_2O_3
D	CrO
E	$NaCrO_2$
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	Concentrated nitric acid and crystalline lead dioxide were added to a solution under examination. The solution turned crimson. This analytical effect indicates presence of:
Correct answer	Manganese (II)
B	Bismuth (III)
C	Iron (III)
D	Chromium (III)
E	Tantum (II)
№	krok 2008
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	Determination of chlorides in potable water can be done by means of mercurymetry. The following solution is used as a titrant:
Correct answer	$Hg(NO_3)_2$
B	$Hg_2(NO_3)_2$
C	$HgCl_2$
D	$HgSO_4$

E	Hg_2Cl_2
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	Excess of ammonia was added to a solution under examination. The solution turned bright blue. This indicates presence of the following ions:
Correct answer	Copper
B	Silver
C	Lead
D	Bismuth
E	Mercury (II)
№	krok 2008
Topic	Precipitating titration. Complexiметer. Physico-chemical methods of analysis.
Task	Determination of sodium and potassium chlorides in pharmaceuticals can be done by means of:
Correct answer	Argentometry, Mohr method
B	Reduction-oxidation titration
C	Alkalimetry
D	Acidimetry
E	Chelatometry
№	krok 2008
Topic	Analysis of cations of I-III analytical groups
Task	Diluted solution of hydrochloric acid was added to a solution under examination. This resulted in origin of white caseous deposition. This is the evidence of presence of following ions:
Correct answer	Silver
B	Ammonium

C	Iron (II)
D	Barium
E	Iodine
№	krok 2008
Topic	Analysis of anions
Task	A solution under examination was added to the solution of $FeSO_4$ in presence of concentrated H_2SO_4. Generation of a brown ring indicates presence of:
Correct answer	Nitrate ions
B	Acetate ions
C	Carbonate ions
D	Oxalate ions
E	Phosphate ions
№	krok 2008
Topic	Gravimetry. Acid-basic titration.
Task	Cations of the third analytical group (acid-base classification) can be isolated in course of systematic analysis by means of the following group reagent:
Correct answer	1 M solution of sulfate acid in presence of ethanol
B	1 M solution of potassium chromate
C	0,1 M solution of sodium carbonate
D	0,1 M solution of ammonium oxalate
E	1 M solution of ammonium carbonate
№	krok 2008
Topic	Analysis of anions
Task	Solution of potassium iodide was added to the solution acidated with sulfate acid that contained anions of the third analytical group. Release of free iodine is observed. What anion are present in the solution?

Correct answer	Nitrite ion
B	Carbonate ion
C	Sulfate ion
D	Bromide ions
E	Acetate ions
№	krok 2008
Topic	Analysis of cations of I-III analytical groups
Task	During gravimetric determination of mass fraction of sulfate ions in the magnesium sulfate preparation precipitation is performed by means of barium chloride solution. Precipitated barium sulfate should be rinsed with:
Correct answer	Diluted solution of sulfate acid
B	Distilled water
C	Solution of barium chloride
D	Solution of sodium sulfate
E	Solution of hydrochloride acid
№	krok 2008
Topic	Oxidation-reducing titration
Task	Choose a pair of substances that can be used for standardization of 0,1 M solution of $KMnO_4$:
Correct answer	$Na_2C_2O_4$, $H_2C_2O_4$
B	K_2CO_3, CH_3COOH
C	CH_3COOK, $H_2C_2O_4$
D	KHC_2O_4, $HCOOH$
E	$Na_2C_2O_4$, CH_3COOH
№	krok 2008
Topic	Oxidation-reducing titration

Task	Permanganatometry enebles determination of H_2O_2 in high-acidity medium. What acid can be used for production of such medium?
Correct answer	H_2SO_4
B	HCl
C	HNO_3
D	CH_3COOH
E	H_3PO_4
№	krok 2008
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	You are given 0,05 M solution of EDTA. What is standard substance for standardization of this solution?
Correct answer	Metallic zinc
B	Sodium tetraborate
C	Sodium hydroxide
D	Oxalic acid
E	Potassium dichromate
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	A compound undeer examination contains cations of iron (III) and copper (II). What group reagent can separate these cations?
Correct answer	Concentrated ammonia solution
B	Solution of sodium hydroxide and hydrogen peroxide
C	Concentrated solution of hydrochloride acid
D	Solution of sodium hydroxide
E	Concentrated solution of sulfuric acid
№	krok 2008

Topic	Analysis of cations of IV-VI analytical groups
Task	You have to carry out a qualitative analysis. What substance will originate from chromium ions under the influence of group reagent excess (solution of sodium hydroxide) upon cations of the IV analytical group?
Correct answer	Sodium hexahydroxochromate (III)
B	Chromium (III) hydroxide
C	Chromium (III) oxide
D	Chromium (II) hydroxide
E	Chromium (II) oxide
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	Presence of the following ion of *d*-elements in solutions can be exploited by means of $K_4[Fe(CN)_6]$:
Correct answer	Fe^{3+}
B	Zn^{2+}
C	Cr^{3+}
D	Ni^{2+}
E	Cu^{2+}
№	krok 2008
Topic	Gravimetry. Acid-basic titration.
Task	Choose an appropriate indicator for fixation of titration end point in method of bromatometry:
Correct answer	Methyl red
B	Phenolphthalein
C	Starch

D	Methyl blue
E	Tropeolin 00
№	krok 2008
Topic	Analysis of cations of IV-VI analytical groups
Task	What cations added to the solution of potassium iodide form orangered deposition that is soluble in reagent excess and builds up a colourless solution?
Correct answer	Mercury (II)
B	Mercury (I)
C	Bismuth
D	Antimony (V)
E	Lead
№	krok 2007
Topic	Analysis of cations of IV-VI analytical groups
Task	Choose reagents for detection of nitrite ions in presence of nitrate ions contained in a pharmaceutical under examination:
Correct answer	Antipyrin and chlorohydrogen acid (diluted)
B	Iron (II) sulfate (diluted) and potassium iodide
C	Iron (III) sulfate (concentrated) and potassium bromide
D	Iron (II) chloride
E	Iron (III) chloride
№	krok 2007
Topic	Gravimetry. Acid-basic titration.
Task	A chemist in an analytical laboratory needs to standardize a sodium hydroxide solution. What primary standard solution can be used for this purpose?
Correct answer	Oxalic acid
B	Acetic acid
C	Chlorohydrogen acid

D	Sodium tetraborate
E	Sodium chloride
№	krok 2007
Topic	Analysis of cations of IV-VI analytical groups
Task	Name the type of reaction applied for detection of Fe^{3+} cation:
Correct answer	Complexing
B	Precipitation
C	Hydrolysis
D	Neutralization
E	Renewing
№	krok 2007
Topic	Gravimetry. Acid-basic titration.
Task	Quantitative determination of pharmaceutical substances can be done by method of acidimetry. Its titrant is the secondary standard solution of chloride acid. What compound helps to determi-ne the precise concentration of chloride acid?
Correct answer	Sodium tetraborate
B	Oxalate acid
C	Potassium dichromate
D	Sodium thiosulfate
E	Magnesium sulfate
№	krok 2007
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	Presence of chlorides in drinking water can be detected by method of mercuri-metry. One of the following solutions is used as titrant:
Correct answer	$Hg(NO_3)_2$
B	$Hg_2(NO_3)_2$

C	$HgCl_2$
D	$HgSO_4$
E	Hg_2Cl_2
№	krok 2007
Topic	Oxidation-reducing titration
Task	Name the type of reaction that takes place during detection of ascorbic acid in a preparation by iodometric method:
Correct answer	Oxidation-reduction
B	Acylation
C	Neutralization
D	Precipitation
E	Complexing
№	krok 2007
Topic	Precipitating titration. Complexi meter. Physico-chemical methods of analysis.
Task	During quantitative estimation of glucose by polarimetric method the following factor is measured:
Correct answer	Angle of rotation of polarized beam plane
B	Coefficient of light refraction
C	Rate of polarized beam absorption by a solution
D	Beam dispersion by a solution
E	Optical density of a solution
№	krok 2007
Topic	Precipitating titration. Complexi meter. Physico-chemical methods of analysis.
Task	Quantitative content of calcium chloride can by measured by method of direct chelatometric titration. Choose an indicator for registering the end point of ti-tration:
Correct answer	Eriochrome black T

B	Phenolphthalein
C	Methyl red
D	Eosin
E	Starch
№	krok 2007
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	Sodium and potassium chlorides in preparations can be detected by means of:
Correct answer	Argentometry, More's method
B	Oxidation-reduction titration
C	Alkalimetry
D	Acidimetry
E	Chelatometry
№	krok 2007
Topic	Analysis of cations of I-III analytical groups
Task	Adding of a diluted solution of chlorohydrogen acid to a solution under examination resulted in formation of white caseous sediment. It is the evidence of presence of the following ions:
Correct answer	Silver
B	Ammonium
C	Iron (II)
D	Barium
E	Iodine
№	krok 2007
Topic	Oxidation-reducing titration
Task	Name a standard solution of iodometric determination of reducing agents (direct titration)?

Correct answer	Solution of I_2
B	Solution of $KMnO_4$
C	Solution of $Na_2S_2O_3$
D	Solution of $K_2Cr_2O_7$
E	Solution of KI
№	krok 2007
Topic	Analysis of cations of IV-VI analytical groups
Task	Under certain conditions of qualitative analysis $K_4[Fe(CN)_6]$ is a specific reagent to Fe^{3+} cations. What colour is the precipitate?
Correct answer	Blue
B	White
C	Brown
D	Red
E	Black
№	krok 2007
Topic	Precipitating titration. Complexіmeter. Physico-chemical methods of analysis.
Task	What standard solution (titrant) is used in Folgard's method of direct titration?
Correct answer	Ammonium thiocyanate
B	Sodium chloride
C	Silver nitrate
D	Potassium chromate
E	Potassium dichromate
№	krok 2007
Topic	Oxidation-reducing titration
Task	Quantitative content of iron (II) can be determined by non-indicator method of:
Correct answer	Permanganatometry

B	Chelatometry
C	Argentometry
D	Iodometry
E	Nitritometry
№	krok 2007
Topic	Oxidation-reducing titration
Task	Permanganatometric determination of H_2O_2 can be done in a very acid medium. What acid allows to produce medium for permanganatometric determination?
Correct answer	H_2SO_4
B	$H\,Cl$
C	$H\,N\,O_3$
D	CH_3COOH
E	$H_3P\,O_4$
№	krok 2007
Topic	Precipitating titration. Compleximeter. Physico-chemical methods of analysis.
Task	Coulometry is based upon measurement of electrics that is spent on electrode reaction. What law underlies coulometric method?
Correct answer	Faraday law
B	Archimedes' principle
C	Newton law
D	Stokes law
E	Bouguer-Lambert-Beer law
№	krok 2007
Topic	Gravimetry. Acid-basic titration.

Task	To determine mass concentration of calcium in a medical preparation the gravimetric precipitation method was applied. Solution of ammonium oxalate was used as a precipitator. The gravimetric form in this case is:
Correct answer	Calcium oxide
B	Anhydrous calcium oxalate
C	Monohydrous calcium oxalate
D	Calcium carbonate
E	Calcium hydroxide
№	krok 2007
Topic	Analysis of anions
Task	Choose reagents for detection of sulphateions in a solution that contains carbonate-, sulfate-, thiosulfate-, phosphate-anions:
Correct answer	$Ba(NO_3)_2$, HCl
B	$Ba(NO_3)_2$, $NaOH$
C	$BaCl_2$, H_2O
D	$CaCl_2$, NH_4OH
E	$AgNO_3$, HNO_3
№	krok 2007
Topic	Oxidation-reducing titration
Task	For dichromatometric determination of $FeSO_4$ content in the solution with potentiometric fixation of equivalence point the following indicator electrode is applied:
Correct answer	Platinum
B	Glass
C	Quinhydrone
D	Argental

E	Chloroargentic
№	krok 2007
Topic	Oxidation-reducing titration
Task	Nitritometric determination of primary aromatic amines in acidic medium results in generation of the following reaction product:
Correct answer	Diazonium salt
B	Nitrosoamine
C	Nitrose arylenamine
D	Nitrose antipyrine
E	Azide
№	krok 2007
Topic	Oxidation-reducing titration
Task	Quantitative determination of iodide can be done by method of:
Correct answer	Oxidation-reduction titration
B	Acid-base titration
C	Chelatometry
D	Spectrophotometry
E	Precipitating titration
№	krok 2007
Topic	Analysis of cations of IV-VI analytical groups
Task	Solution of a medicinal preparation under examination contains cations of magnesium (II) and aluminium (III). What reagent will help to separate these cations during analysis of this preparati-on?
Correct answer	Alkali solution
B	Hydrogen peroxide in acidic medium
C	Argentum nitrate solution
D	Hydrogen peroxide in ammoniac medium

E	Chloride acid solution
№	krok 2018
Topic	Redox titration
Task	What titrimetric method of analysis requires the use of both external and internal indicators?
Correct answer	Nitritometry
B	Alkalimetry
C	Complexometric titration
D	Permanganatometry
E	Argentometry
№	krok 2018
Topic	Analysis of cations I-III analytical groups
Task	To determine qualitative content of a drug, the drug sample was processed with 2M solution of HCl. White precipitate soluble in aqueous ammonia solution was formed. This analytical effect indicates the presence of the following cations:
Correct answer	Silver(I)
B	Lead(II)
C	Mercury(I)
D	Mercury(II)
E	Tin(II)
№	krok 2018
Topic	Redox titration
Task	Quantitative content of hydrogen peroxide can be determined by means of the following selfindicator method:
Correct answer	Permanganatometry
B	Bromatometry
C	Iodometry

D	Nitritometry
E	Argentometry
№	krok 2018
Topic	Sedimentary titration. Complexіmetry. Physico-chemical methods of analysis
Task	The Mohr method is used to determine mass concentration of sodium chloride in an isotonic solution. Titration is carried out with the following indicator:
Correct answer	Potassium chromate
B	Fluorescein
C	Ammonium iron(III) sulfate
D	Diphenylcarbazone
E	Ferroin
№	krok 2018
Topic	Sedimentary titration. Complexіmetry. Physico-chemical methods of analysis
Task	Laboratories of various specialization use the following method to determine general water hardness of potable water:
Correct answer	Complexometric titration
B	Acidimetry
C	Precipitation
D	Oxidimetry
E	Alkalimetry
№	krok 2018
Topic	Analysis of cations I-III analytical groups
Task	Name the reaction producing a golden-yellow precipitate (”golden rain” reaction):
Correct answer	Precipitation of $P\,bI_2$
B	Precipitation of $P\,bC\,l_2$
C	Precipitation of AgI

D	Precipitation of HgI_2
E	Precipitation of Hg_2I_2
№	krok 2018
Topic	Analysis of cations I-III analytical groups
Task	Name the reactions and reagents that under certain conditions allow determination of certain ions in the presence of other ions:
Correct answer	Specific
B	Selective
C	Group
D	Characteristic
E	General
№	krok 2018
Topic	Redox titration
Task	What standard solution can be used to standardize the solution of I_2?
Correct answer	Sodium thiosulfate solution
B	Potassium iodide solution
C	Potassium dichromate solution
D	Potassium permanganate solution
E	Sodium nitrite solution
№	krok 2018
Topic	Sedimentary titration. Complexiметry. Physico-chemical methods of analysis
Task	Ammonium iron(III) sulfate can be used as an indicator in:
Correct answer	Argentometry, Volhard method
B	Argentometry, Mohr method
C	Alkalimetry
D	Acidimetry

E	Complexometric titration
№	krok 2018
Topic	Redox titration
Task	Quantitative determination of iodine is done by means of:
Correct answer	Redox titration
B	Alkalimetry
C	Complexometric titration
D	Acidimetry
E	Precipitation titration
№	krok 2018
Topic	Sedimentary titration. Complexiметry. Physico-chemical methods of analysis
Task	Separation of substances in chromatography is based on the ability of solutes:
Correct answer	To distribute between the mobile and stationary phases
B	To distribute between two mobile phases
C	To distribute between two stationary phases
D	To dissolve
E	To precipitate
№	krok 2018
Topic	Redox titration
Task	Quantitative content of oxalic acid can be determined by means of permanganatometry. How to determine equivalence point for this kind of titration?
Correct answer	When titrate changes its color after another drop of process solution is added
B	With redox indicator diphenylamine
C	With pH indicator
D	With specific indicator
E	With adsorption indicator
№	krok 2018

Topic	Redox titration
Task	Specify what method of redox titration requires the use of specific indicator - starch - to fix the end point:
Correct answer	Iodometry
B	Permanganatometry
C	Nitritometry
D	Cerimetry
E	Bromatometry
№	krok 2018
Topic	Analysis of anions
Task	Pharmacopoeia reaction to determine benzoate ions requires interaction with the solution of:
Correct answer	Iron(III) chloride
B	Potassium chloride
C	Resorcin
D	Acetic anhydride
E	Diphenylamine
№	krok 2018
Topic	Sedimentary titration. Complexіmetry. Physico-chemical methods of analysis
Task	What solution can be used to detrmine the presence of chloride ions in the potable water?
Correct answer	Silver nitrate
B	Iodine
C	Potassium bromate
D	Sodium hydroxide
E	Ammonia
№	krok 2018

Topic	Redox titration
Task	A specialist of the analytical laboratory performs direct iodometric determination of ascorbic acid. What indicator is used in this case?
Correct answer	Starch
B	Methyl orange
C	Diphenylamine
D	Phenolphthalein
E	Methyl red
№	krok 2018
Topic	Sedimentary titration. Complexіmetry. Physico-chemical methods of analysis
Task	What indicator is used for fixing the endpoint of mercurimetric titration?
Correct answer	Thiocyanate complexes of iron(III)
B	Fluorescein
C	Eosin
D	Murexide
E	Potassium chromate
№	krok 2018
Topic	Sedimentary titration. Complexіmetry. Physico-chemical methods of analysis
Task	How according to the Pharmacopoeia is pH determined?
Correct answer	Potentiometry
B	Spectrophotometry
C	Indicator
D	Conductometry
E	Polarography
№	krok 2018
Topic	Sedimentary titration. Complexіmetry. Physico-chemical methods of analysis

Task	Quantitative determination of iodides by Fajans method is performed with adsorption indicators. The following can be used as an adsorption indicator:
Correct answer	Eosin
B	Methyl orange
C	Phenolphthalein
D	Diphenylamine
E	Murexide
№	krok 2018
Topic	Analysis of cations IV-VI analytical groups
Task	Pharmacopoeia reaction of potassium ferrocyanide with zinc cations produces:
Correct answer	White precipitate
B	Red precipitate
C	Violet precipitate
D	Yellow precipitate
E	Black precipitate
№	krok 2018
Topic	Analysis of anions
Task	Rapid analysis of benzoate ions by means of Pharmacopoeia reaction with iron(III) chloride produces:
Correct answer	Pink-yellow precipitate
B	Green precipitate
C	Blue precipitate
D	Red precipitate
E	Black precipitate
№	krok 2018
Topic	Gravimetry. Acid-base titration

Task	The following is used to determine the titrant volume in the process of titrimetric analysis:
Correct answer	Burettes
B	Measuring flasks
C	Measuring glasses
D	Cylinders
E	Measuring tubes
№	krok 2018
Topic	Analysis of cations I-III analytical groups
Task	Hydrochloric acid was added into the solution under investigation. The resulting precipitate was filtered, then this filter cake was processed with hot water; after the filtrate cooled, *KI* solution was added into it. What cation was present in the solution, if the precipitate was colored yellow?
Correct answer	Pb^{2+}
B	Ag^{+}
C	Hg^{2+}
D	Ca^{2+}
E	Ba^{2+}
№	krok 2018
Topic	Analysis of cations I-III analytical groups
Task	The third analitycal group of cations (acid-base classification) includes Ca^{2+}, Sr2+, Ba2+. What acid can function as a precipitator agent (group reagent) for these cations?
Correct answer	H_2SO_4
B	HNO_3

C	HCI
D	CH_3COOH
E	$HClO_4$
№	krok 2018
Topic	Redox titration
Task	Permanganatometry is used in determination of many organic and inorganic compounds. What are the main advantages of permanganatometry over the other oxidimetric methods?
Correct answer	Sufficiently high redox potential; it is possible to determine titration endpoint without indicator
B	Sufficiently high stability of potassium permanganate and its solutions
C	High selectivity and sensitivity when determining compounds
D	Pure potassium permanganate is easily available and obtainable
E	Various types of indicators can be used; in some cases catalysts are necessary to accelerate the reaction
№	krok 2018
Topic	Analysis of anions
Task	Silver nitrate solution was added into a solution with anions of the first analytical group. A yellow precipitate was produced as the result, which indicates that this solution contained:
Correct answer	Arsenite ions
B	Arsenate ions
C	Sulfate ions
D	Iodide ions
E	Bromide ions
№	krok 2018

Topic	discipline Analytical chemistry
Task	topic Analysis of cations IV-VI analytical groups What cation can be detected with Chugaiev's agent (Dimethylglyoxime)?
Correct answer	Ni^{2+}
B	Ca^{2+}
C	-
D	Mn^{2+}
E	Co^{2+}
№	krok 2018
Topic	Gravimetry. Acid-base titration
Task	Choose the weakest carboxylic acid basing on its pKa value:
Correct answer	Propionic acid (pKa = 4.9)
B	Acetic acid (pKa = 4.7)
C	Formic acid (pKa = 3.7)
D	Lactic acid (pKa = 3.9)
E	Butyric acid (pKa = 4.82)
№	krok 2021
Topic	03. Analysis of anions
Task	Nitrate anions, unlike nitrite anions, do not interact with:
Correct answer	Potassium permanganate
B	Diphenylamine
C	Iron(II) sulfate and sulfuric acid
D	Sulfanilic acid
E	Antipyrine
№	krok 2021

Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	Select an indicator for argentometric determination of chloride ions using the Mohr method:
Correct answer	Potassium chromate
B	Diphenylcarbazone
C	Methyl red
D	Eosin
E	Fluorescein
№	krok 2021
Topic	05. Redox titration
Task	Hydrogen peroxide content can be determined without indicators, by means of the following redox titration:
Correct answer	Permanganatometry
B	Alkalimetry
C	Acidimetry
D	Complexonometric titration
E	Argentometry
№	krok 2021
Topic	02. Analysis of cations of IV-VI analytical groups
Task	Excess 6M sodium hydroxide solution and 3% hydrogen peroxide solution were added into the solution being analyzed. The solution colored yellow when heated, which indicates the presence of:
Correct answer	Chromium(III) cations
B	Aluminum cations
C	Zinc cations
D	Lead cations

E	Tin(II) cations
№	krok 2021
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	What method of analysis can an analytical chemist use to determine the aluminum content in a medicinal product alumag (maalox, algeldrate + magnesium hydroxide) by means of an indirect titration?
Correct answer	Complexonometric titration
B	Argentometry
C	Iodometry
D	Mercurometry
E	Dichromatometry
№	krok 2021
Topic	01.Analysis of cations of I-III analytical groups
Task	What cations belong to the II analytical group according to the acid- base classification?
Correct answer	Silver, lead, mercury(I)
B	Potassium, barium, bismuth
C	Zinc, aluminum, chromium
D	Aluminum, magnesium, zinc
E	Calcium, strontium, barium
№	krok 2021
Topic	05. Redox titration
Task	Why must iodimetric determination be performed in cold conditions?
Correct answer	When heated, iodine becomes more volatile and the sensitivity of starch indicator decreases
B	When heated, iodine can be easily oxidized by atmospheric oxygen

C	When heated, iodine decomposes to form atomic iodine
D	Reactions with iodine become less selective, when heated
E	When heated, iodine reacts with water to form hypoiodous acid (HIO)
№	krok 2021
Topic	01.Analysis of cations of I-III analytical groups
Task	Name the method of binding foreign ions in an analysis:
Correct answer	Analytical masking
B	Analytical coprecipitation
C	Analytical extraction
D	Analytical concentration
E	Analytical separation
№	krok 2021
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	What method is based on the reactions of halide precipitation in the form of sparingly soluble mercury(I) salts?
Correct answer	Mercurometry
B	Permanganatometry
C	Rodanometry
D	Argentometry
E	Trilonometry
№	krok 2021
Topic	01.Analysis of cations of I-III analytical groups
Task	The researcher, while conducting the qualitative analysis that involves precipitation of the third analytical group cation sulfates (Ca^{2+}, Sr^{2+}, Ba^{2+}), has to reduce the solubility of the sulfates. What substance should the researcher use for this purpose?

Correct answer	Ethyl alcohol
B	Distilled water
C	Benzene
D	Amyl alcohol
E	Chloroform
№	krok 2021
Topic	02. Analysis of cations of IV-VI analytical groups
Task	To separate cations of the 6th analytical group from cations of the 5th analytical group (acid-base classification), the following is used:
Correct answer	Excess ammonia solution
B	Excess sulfuric acid solution
C	Excess sodium hydroxide solution
D	Silver nitrate solution
E	Acetic acid solution
№	krok 2021
Topic	04. Gravimertic analysis. Acid-base titration.
Task	The gravimetric determination of moisture in pharmaceutical products is performed, using the following method:
Correct answer	Indirect volatilization gravimetry
B	Particulate gravimetry and direct volatilization gravimetry
C	Particulate gravimetry
D	Direct volatilization gravimetry
E	Precipitation gravimetry
№	krok 2021
Topic	01.Analysis of cations of I-III analytical groups
Task	If addition of an alkali solution and heating provokes the release of ammonia in an analyzed solution, it indicates that the analyzed solution contains the following ions:

Correct answer	NH_4^+
B	NO_3^-
C	Na^+
D	K^+
E	NO_2^-
№	krok 2021
Topic	01.Analysis of cations of I-III analytical groups
Task	Salts of an unknown cation, when brought into the flame of a burner, change the flame color to brick-red. What cation is it?
Correct answer	Calcium
B	Lead
C	Ammonium
D	Manganese
E	Magnesium
№	krok 2021
Topic	06. Precipitation titration. Complexiметry(complexiметric titration). Physico-chemical methods of analysis.
Task	What anions interfere with the determination of halide ions by means of the Volhard method, because they form a strong colorless complex with iron(III) ions?
Correct answer	F^-
B	NO_2^-
C	MnO_4^-
D	SO_3^{2-}
E	NO_3^-

№	krok 2021
Topic	02. Analysis of cations of IV-VI analytical groups
Task	A solution contains calcium, barium, aluminum, potassium, and sodium cations. Into this solution a small amount of ammonium hydroxide and alizarin solution were added, which resulted in production of a red precipitate. What ion was detected in the result of this reaction?
Correct answer	Aluminum
B	Calcium
C	Potassium
D	Barium
E	Sodium
№	krok 2021
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	Photometry is one of the most common instrumental methods of analysis. It is based on the measurement of:
Correct answer	Optical density
B	Rotation angle
C	Refractive index
D	Wavelength
E	Fluorescence intensity
№	krok 2021
Topic	06. Precipitation titration. Complexіmetry(complexіmetric titration). Physico-chemical methods of analysis.
Task	Polarimetry is used to determine the compounds that contain an asymmetric carbon atom. What compound can be determined, using this method?
Correct answer	Glucose

B	Cuprum sulfate
C	Sodium chloride
D	Calcium nitrate
E	Potassium iodide
№	krok 2021
Topic	02. Analysis of cations of IV-VI analytical groups
Task	In systematic analysis of group IV cations, hydrogen peroxide should be added along with the group reagent. Why should it be added?
Correct answer	For formation of hydroxo- and oxoanions of these elements at the highest oxidation degrees
B	For formation of peroxide compounds of these cations
C	For destruction of hydrate complexes
D	For more complete precipitation of these cations
E	For formation of hydroxo- and oxoanions of these elements at the lowest oxidation degrees
№	krok 2021
Topic	04. Gravimertic analysis. Acid-base titration.
Task	What indicators are used to determine the titration endpoint in the acid-base titration method?
Correct answer	pH indicators
B	Adsorption indicators
C	Redox indicators
D	Metal indicators
E	Luminescent indicators
№	krok 2021
Topic	03. Analysis of anions

Task	An analytical chemist conducts a qualitative analysis of phosphate ions, using a pharmacopoeial reaction that produced a yellow precipitate as a result. What reagent did the expert use?
Correct answer	Silver nitrate
B	Hydrochloric acid
C	Potassium chloride
D	Sodium nitrate
E	Potassium nitrate