"Bliis-Survey" And "Fsmu" Technology In A Practical Training On The Subject "Chemistry Of Coordination Compounds"

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ABSTRACT

This article provides examples of the application of "Blitz-survey" and "FSMU" technologies in a practical exercise on the topic "Chemistry of coordination compounds". First of all, information on the Blitz-survey method and FSMU technologies, transfer technology, stages of implementation of this technology are studied and methods of application in practice are described.

Keywords: Coordination compounds, Blitz-survey method, FSMU technology, practical training, teacher, education, crystal field theory, types of isomerism.

Today, comprehensive reforms in the field of education, state decisions to improve the content of education, link education with life, increase the effectiveness of teaching and comprehensive development of a rapidly developing society require the education of the generation. At this point, the introduction and use of new pedagogical technologies in the educational process is directly related to the requirements of the time.

It is known that the new pedagogical technology is a product of a form, method and means of education aimed at specific goals. Studies show that in most cases the teacher only works during the lesson and the students remain observers. This form of education does not increase students' intellectual thinking, does not increase their activity and suppresses their creative activity in the educational process [1-8].

We are considering the issue of using interactive methods when organizing a practical lesson on the topic “Chemistry of coordination compounds”. The lesson can be started by using Blis-Request technology to review, recall and build a foundation for a new topic (hands-on exercise). This technology is aimed at teaching students to correctly organize the sequence of actions, think logically and choose what they need from many, different opinions and information based on the subject they are studying. Through this technology, students are able to share their independent thoughts with others as this technology provides the perfect environment for this. In Blis pedagogy it is used in the sense of quickly, instantaneously. In this

technology, students are asked to answer questions (orally, in writing, in the form of a table or diagram) based on the main concepts and basic phrases of the entire topic being studied or a specific part of it.

For example: Flash Question 1 Method: The formula of several complex compounds is given and the student is asked to name them. This can be accomplished by writing two separate sheets of paper, giving them to the student, and writing the answers on that sheet.

1. $[Cr(H_2O)_3PO_4]$ - name it.
2. Kalsiy kesagidroksoalyumanat -write the formula.
3. $[Pt(NH_3)_5Cl]Cl_3$ – name it.
4. Kaliy trioksalatoferrat- name it.
5. $H[PF_6]$-name it.
6. Geksaakvanikel (II) xlorid-write the formula.
7. $[Fe(H_2O)_6]SO_4 \cdot H_2O$-name it.
8. Ammoniy tetraxloridodigidroksiplatinat- write the formula.

The students show the answers to these questions to the teacher. In this case, the teacher gives them the correct answer and evaluation of the students.

Assignment answer:

$[Cr(H_2O)_3PO_4]$ - fosfatotriakvaxrom.

1. Kalsiy geksagidroksoalyuminat - $Ca_3[Al(OH)_6]_2$
2. $[Pt(NH_3)_5Cl]Cl_3$ – xloropentaammin(IV) xlorid
3. Kaliy trioksalatoferrat- $K_3[Fe(C_2O_4)_3]$
4. $H[PF_6]$-Vodorod geksaftorofosfat yoki geksaftorofosfat kislota.
5. Geksaakvanikel (II) xlorid- $[Ni(H_2O)_6]Cl_2$.
6. $[Fe(H_2O)_6]SO_4 \cdot H_2O$-Geksaakvatemir (II) sulfat kristallogidrati.
7. Ammoniy tetraxloridodigidroksiplatinat- $(NH_4)_2$ $[Pt(OH)_2Cl_4]$.
    1. Students who complete these tasks can be given more complex tasks. For example:
    2. $[Fe(NH_2CH_2COO)_3]$ -name it.
    3. $[Cr(NH_2CH_2CH_2NH_2)_3]Cl_2$-name it.
    4. $[Cr(NH_2CH_2CH_2NH_2)_3][Fe(C_2O_4)_3]$ – name it.
    5. $[Cu(NH_2CH_2CH_2NH_2)_2]C1_2$ –name it.
    6. $[Pd(H_20)(NH_3)_2Cl]Cl$ – name it.
    7. $[Co(H_20)(NH_3)_4CN]Br_2$ -name it.
    8. Natriy diixlorodinitritodiasetatoplatinat(IV) write the formula
    9. Etilendiamintetrasirka kislotasining dinatriyli tuzi (trilon B) write the formula

It is appropriate to use “FSMU” technology to resolve controversial issues and conduct debates after studying a section based on a training seminar or plan. Because this technology allows students to defend their opinions, think freely and share their opinions with others, debate openly and at the same time analyze the knowledge acquired by students in the educational process, evaluate and discuss the extent of their acquisition. This technology helps students express their thoughts clearly and succinctly on a simple piece of paper that is distributed.

Transfer technology:

This technology will be implemented in several stages.

Stage 1

It is explained that it is necessary to write reaction equations for obtaining complex compounds.In the practical session, a question is asked to continue 13-15 (depending on the number of students) chemical reaction equations with the help of a slide presentation. Chemical reaction equations are distributed to students.

Complex compounds can be obtained through coupling reactions:

$HgI_2 + KI_{(mol)} =$ $H_2C_2O_4 + FeCI_3 + NaOH =$

$CaCl_2 + NH_3 =$ $CrCl_3 + H_20 =$

$Fe(CN)_2 + KCN =$ $Fe(CN)_3 + KCN =$

Through redox reactions:

$[Co(NH)_5(H_2O)]$ $CI_2 + NH_4CI + H_2O_2 =$ $Ag + KCN + 0_2 + H_20 =$

By forming complex acids, bases and salts:

$Au+HN0_3+HC1 =$ $Au(OH)_3 + HCI =$

$Cu(OH)_2 + NH_4OH =$ $FeCI_3 + KCNS =$

Through replacement and exchange reactions of ligands in the complex compound: $[Cu(NH_3)_4]S0_4 + KCN =$

$[Co(NH_3)_5\ SI]Cl_2 + H_2O =$

$K|Ag(CN)_2| + Zn =$

Stage 2

Care is taken to ensure that each student must continue the equations for coupling reactions of complex compounds, oxidation-reduction reactions, the formation of complex compounds, bases and salts, and substitution and exchange reactions of ligands in the complex compound.

-Papers with the 4th level of FSMU technology were distributed to each student:

F- give your opinion.

S- Explain your statement.

M- Give an example (bold) to prove your reason.

U- Summarize your opinion.

- Each student completes the 4th level of the FSMU individually on paper with a written statement.

F-complex compounds are complex compounds that contain a central atom and ligands. In solution they form complex cations or anions, and sometimes also neutral molecules.

S-The formation of complex molecules from simple molecules without forming a new chemical bond or forming a new pair of electrons leads to complex compounds. Valence is determined by the number of electrons gained and lost in complex compounds.

M- A complex substance formed by the action of calcium chloride and ammonia is a complex:

$CaCl_2 + 8NH_3 = [Ca(NH_3)_8]Cl_2$

crystal

Basics:$[Ag(NH_3)_2]OH$, $[Cu(NH_3)_2](OH)_2$, $[Ni(NH_3)_4](OH)_2$;

Acids: $[AuC1_4]$, $H_2[SnF_6]$, $H_2[PtCl_6]$;

Salts: $[Ni(NH_3)_4]S0_4$, $Na_3[AlF_6]$, $K_3[Fe(CN)_6]$;

Non-electrolytic substances: $[Pt(NH_3)_2Cl_2]$, $[Ni(CO)_4]$, $[Fe(CO)_5]$.

U- A complex-forming ion or atom is surrounded by a certain number of anions or neutral molecules bound to it. These anionic or neutral molecules are called ligands. And the number of the connection is called the coordination number (k.s.).

Stage 3

The students deal with the continuation of chemical reaction equations.

- After each student completes their work, the teacher asks them to divide into two groups, or divides the students into small groups using different grouping methods.

Group 1. They deal with equations for obtaining complex compounds through coupling reactions and oxidation-reduction reactions;

Group 2. They deal with the equations of the formation of complex acids, bases and salts and the formation of complex compounds through replacement and exchange reactions of ligands in the complex compound;

The teacher offers small groups to write in four phases, summarizing in a large format the ideas and arguments of the works written by each of them.

Stage 4

- In small groups, each student first presents the thoughts they have written for each phase to the group members. After studying all the opinions of the group members, the group members begin to summarize them.
- Members of the group individually summarize the 4th level of the FSMU and prepare for its defense;
- Every student can defend and prove his/her opinion when summarizing opinions.

Stage 5

Small groups defend their general opinions: a group representative reads out each step individually, without commenting as much as possible. Some passages show why the group came up with this idea. They then compare it with the correct answer slides.

Complex compounds can be obtained by coupling reactions:

$HgI_2+2KI_{(mol)}= K_2[HgI_4]$

$H_2C_2O_4 + FeCI_3 + NaOH = Na_3[Fe(C_2O_4)_3]+3NaCI+ 6H_2O$

$CaCl_2 + 8NH_3 = [Ca(NH_3)_8]\ Cl_2$ $CrCl_3 + H_20 =[Cr(H_20)_6]\ Cl_3$

$Fe(CN)_2 + 4KCN = K_4[Fe(CN)_6]$ $Fe(CN)_3 + 3KCN = K_3[Fe(CN)_6]$

Through redox reactions:

$2[Co(NH)_5(H_2O)]CI_2+2NH_4CI+ H_2O_2 = 2[Co(NH)_5CI]CI_2+2NH_3+ 4H_2O$

$4Ag + 8KCN + 0_2 +2H_20 = K[Ag(CN)_2] + 4KOH$

By forming complex acids, bases and salts:

$Au+HN0_3+ 4HC1 = H[AuC1_4] + NO + 2H_20$

$Au(OH)_3 + 4HCI = H[AuC1_4] + 3H_20$

$Cu(OH)_2 + 4NH_4OH = [Cu(NH_3)_4](OH)_2 + 4H_2O$

$FeCI_3 + 6KCNS = K_3[Fe(CN)_6] + 3KCI$

Through replacement and exchange reactions of ligands in the complex compound:

$[Cu(NH_3)_4]S0_4 + 4KCN = K_2[Cu(CN)_4] + 4NH_3 + K_2SO_4$

$[Co(NH_3)_5 SI]Cl_2 + H_2O = [Co(NH_3)_5 H_2O]Cl_3$

$2K[Ag(CN)_2] + Zn = K_2[Zn (CN)_4] + 2Ag$

Stage 6

- The teacher concludes the lesson and expresses his reaction to the opinions expressed.

- addresses the audience with the following questions:

- What did you learn and what did you learn in this training?

- How effective was the use of this technology in the educational process?

- What characteristics are educated and formed in students through the use of this technology? What properties does it develop?

- At what stage of the educational process is it better to use this technology and why?

- What does the use of this technology in the classroom bring to students and what does it teach?

- In what order or in what form can this technology be transferred?

Note: The above questions can be asked by the teacher to students depending on the content and purpose of each lesson.

After the discussion, students can complete the experimental part. Conducting experiments on the topic “Chemistry of coordination compounds” takes 60-70 minutes, provided the necessary equipment, devices and reagents are available.

We can see that the indicators of students' mastery in the lesson conducted using this technology were as follows. 3 out of 14 students in the group scored “above 86 points”; 7. “75 points”; It should be noted that the 4th scored “65 points”.

The use of new technologies enables effective training to be carried out.

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