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EFFECTIVE USE OF INTERESTING EXPERIENCES IN TEACHING CHEMISTRY

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ABSTRACT

This article provides interesting chemistry experiences for teachers to use, and such experiments stimulate students' interest in chemistry

Keywords: water bath, filter, copper wire, "magic inscriptions", "chemical surgery", atseton, glass, alcohol, sapphire, kahrabo, starch, iodine, copper cuporosi, phenolftalein.

Nowadays, a huge change in education is being made. Based on the requirements of the Education Act of the Republic of Uzbekistan and the National Literature Programme, the continuous education system is being reformed gradually and purposefully.

The role of each laboratory in schools is important in improving the quality and effectiveness of chemistry education. In particular, holding chemical nights, musical instruments, various competitions and interesting question-and-answer work requires teachers to work with scientific and scientific literature on a variety of topics.

Interesting experiences, chemical nights, various games, riddles and other activities are very useful in this regard. In the process of preparing and conducting them, new opportunities will be created to expand students' knowledge, to strive for their worldview, and to increase their love of chemistry, ensuring that they are more aware of the extraordinary test of the mysterious world in general.

We can illustrate some experiences based on such experiences. Below you will find out about them.

Can't the lightning in the glass be "lightning" and "lightning" in a glass of water? Surprisingly, that's what happens!

First take 5-6 g of potassium bromide (KBrO3) and 5-6 g of barium chloride digidrate (BaCl2*2H2O) and dissolve these colorless crystalline substances separately during the gradual heating of 100 g of distilled water, then mix the obtained solutions. When the mixture is cooled, the cold-free barium bromide – $Ba(BRO3)_2$ sinks:

$2KBrO3 + BaCl2 = Ba(BrO3)_2 \downarrow + 2KCl$

Precip colorless sediment - Filter the crystals $Ba(BRO3)_2$ and wash it 2-3 times in a small amount (5-10 ml) of cold water. Then dry the washed sediment in the air. After that, dissolve the obtained 2 g $Ba(BrO3)_2$ in 50 ml of boiling water and filter the still warm solution again.

Cool the glass of filtered liquid to 40 to 45 degrees Fahrenheit [-40 to 45°C]. It is better to do this by putting a solution glass (i.e. in a "water bath") in a larger container of water at the same temperature. Check the water temperature in a large container by thermometer, and if the temperature drops, using an electric plate, heat it again to the required level.

Close the window curtains or turn off the room lights. Then, with the formation of crystals in the glass, you will observe that sparks ("lightning") still appear in one place, still another, and

sounds like thunder are heard. Here's the "lightning" in the glass for you! This can be explained by the fact that the noise was from the formation of crystals if the light was the result of the energy that was separated during the crystal process.

Atseton and copper wire At first glance, the mysterious loss of the substance sounds like sorcery. But it can be done in simple experience.

A copper wire with a thickness of 0.8-1.0 mm is prepared, which is cleaned with a lard and made a ring with a diameter of 3-4 cm. One end of the wire rotats 10 to 15 inches [10 to 15 cm] long for use as a handle, and a fork is worn on the tip of the wire, which is previously watered with starje, so that when it is squeezed, the hand does not burn. Then 10-15 ml of atseton – $(CH3)_{2CO}$ is poured into the glass (remember, a fire can quickly break out of the acetone!). Away from a glass with acetone, a ring made of copper wire is heated with a handle, which is then quickly placed in an acetone glass. At the same time, the ring should not rise to the surface of the liquid and be located 5-10 mm deeper than it is. Sim becomes hot as a sink, and she keeps shining brightly until all of the atseton is finished. But neither flames nor smoke are visible! The lamp should be turned off in the room so that the experience will look brighter.

Oxidation of acetic vapor to acetic acid (CH3COOH) and acetic aldehyde (CH3CHO) occurs on the surface of copper, which has served as a catalyst and accelerated the reaction:

$2(CH3)_{2CO} + O2 = CH3COOH + 2CH3CHO$

The resulting embryo was allowed to develop in nutrients and then inserted into her womb, where it implanted. Wheat of these products is colorless, and they can only be known by their smell.

Where did alcohol disappear? If you have a piece of platinum wire (for example, left over from an old platinum thermopara), you can experiment below.

The alcohol lamp is wrapped in a piece of platinum wire, which is 8 to 10 inches [8 to 10 cm] long and 0.5-1.0 mm in diameter, and then the grass is burned. After 5-10 seconds, the alcohol lamp is turned off. But the wire will continue to burn flat. This can be evident when turning off the lamp. This lasts until the alcohol is completely complete.

Ethyl alcohol (C2H5OH) is oxidized with the participation of air oxygen and catalyst – platinum; In this case, so much energy is separated that the wire becomes a reddish-brown sink. Oxidation products – carbon dioxide (CO2) and water:

$C2H5OH + 3O2 = 2CO2 \uparrow + 3H2O \uparrow$

The spear of the eyelid promised to turn purple bitterstone crystals into topaz, kahrabo, ruby, emerald to impress the viewers.

Are real precious stones derived from bitterness? Of course, this is not possible. But it is possible to make solutions that cause the colors of emerald, ruby, cahrabo and topaz. To do this, the eyeball needs to be very upset by chemical reactives. It is dissolved in water and extracted from a purple solution of chromium calcium bitterness [potassium-chromium sulphate crystallogidrate – KCr(SO4)2*12H2O]. Treatment of this solution with a large amount of potassium hydroxide (KOH) or sodium hydroxide (NaOH) leads to the formation of an emerald-colored solution:

$KCr(SO4)_2 + 6KOH = K3[Cr(OH)_6] + 2K2SO4$

Green color is provided with the participation of potassium hexahychroxromatosis - K3[Cr(OH)6]. If hydrogen peroxide (H2O2) is added to the solution, the green color changes to yellow - topaz color:

$2K3[Cr(OH)_6] + 3H2O2 = 2K2CrO4 + 2KOH + 8H2O$

Such coloring of the solution is caused by potassium chromat (K2CrO4). Oxidation of the yolk solution with sulfuric acid (H2SO4) creates a fiery, or kahrabo color:

$K2CrO4 + H2SO4 = K2Cr2O7 + K2SO4 + H2O$

A water solution of potassium dichromat (K2Cr2O7) has an orange color. Finally, when hydrogen peroxide and dietil ephah (C2H5)2O are added to such a solution, a complex peroxide compound, $CrO(O2)_2*(C2H5)_2O$, is produced, in which the ephah layer is painted in bright blue, or "sapphire".

Magic Entries You can open, modify, or "delete" invisible emails based on chemical reactions. To do this, you need to be able to select and use "inks" and openers with appropriate content.

1."Blue inscription on a white paper". The white paper is written and dried with a liquefied solution of iron (III) sulphate, "Chemistry is a place of miracles." If a weak solution of yellow blood salt (potassium hexasiano (II) ferrat is sprinkled on it using a sprayer, a bright blue-colored inscription appears on the surface of the paper:

$2Fe2(SO4)_3 + 3K4[Fe(CN)_6] = Fe4[Fe(CN)_6]_3 + 6K2SO4$

In this case, a hidden inscription "opens" in exchange for the formation of a blue paint called the Berlin Rusty.

2."Invisible hello". The white paper is written and dried with a diluted solution of iron (II)-sulfate, "Hello!". If a weak solution of red blood salt (potassium hexasiano (III) ferrat is sprinkled on it using a sprayer, a hungry blue-colored inscription appears on the surface of the paper:

$3FeSO4 + 2K3[Fe(CN)_6] = Fe3[Fe(CN)_6]_2 + 3K2SO4$

The resulting embryo was allowed to develop in nutrients and then inserted into her womb, where it implanted. Berlin rust - $Fe4[Fe(CN)_6]_3$ are two valuable salts, turnbul blue - $Fe3[Fe(CN)_6]_2$ are complex salts that produce three valuable iron ions.

3."Sprinkle water and write a letter." On a white paper, the words "diarrhea + phenolftalein = colored compound" are written and dried with a liquefied solution of alkaline (or soda solution). It is then sprinkled with a sprayer from a 1% solution of phenolftalein in a mixture of water and alcohol. The recording appears to be reddish.

The phenolftalein indicator is colorless in neutral, acidic and strong alkaline environments and is painted red only in weak alkaline environments (pH=8.2-10). It is not dissolved in water, so it is usually used to dissolve it in alcohol. However, this experiment uses water to the indicator's alcohol solution in order to dissolute diarrhea molecules on the surface of dried writing or to ensure the hydrogen peroxide of soda molecules.

Soda (sodium carbonate) is easily hydrolyzed, as it is a strong foundation and salt formed from weak acid, and its solution acquires an alkaline environment.

$Na2CO3 + 2H2O = 2NaOH + H2CO3(CO2, H2O)$

$CO32- + 2H2O = 2OH^- + H2CO3$

The resulting alkaline environment, on the other hand, is enough to heat a colorless solution of phenolftalein.

4."Blue inscription using yellow water". The white paper is written and dried with a starch clayster, "Starch is exposed to iodine." It is sprinkled with the help of a sprayer, a yellow solution of iodine in potassium memory. A blue color specific to the complex of molecules that starch produces with iodine appears (the inscription "opens"). If the paper is slightly heated in the flames of a alcohol lamp or gas gorelka (do not let the paper burn!), the blue color disappears and the writing becomes light yellow (the color of iodine). The refrigerated recording will be revised again. When the iodine molecular complexes formed by polysaccharides are heated, an easy breakdown causes color changes.

5. "Heating up." In an unspeakable colored piece of paper, cobalt chloride is dehydrated and blue with a diluted pink-colored solution of cobalt chloride, writing, "CoCl2*6H2O – pink-colored, CoCl2 is blue", and crystallization is dehydrated and blue (the writing appears). If the paper is caught in the mouth of a boiling juicy container or blown over it with its mouth, the writing will again be "extinguished" (using water vapors, the cobalt switches to the form of chloride crystallgydrate).

6."Spring in an instant". The white paper is dried by drawing a picture (flowers, grass, birds, etc.) with sulfur salts of two and three valuable iron, liquefied solutions of copper cuporo and vismut nitrate salts. Then a solution of yellow blood salt is soaked in a cotton or a lattice on the surface of this picture. An amazing landscape is formed by a colored landscape. Therefore, each of the above salts produces complex compounds that are colored with yellow blood salt.

Three valuable irons— blue, two valuable iron—are green, three valuable vismuts are yellow, and two valuable coppers become complex salts with dark brown colors and give the drawing a jellyfish:

$3K_4[Fe(CN)_6] + 2Fe_2(SO_4)_3 = Fe_4[Fe(CN)_6]_3 + 6K_2SO_4$

$K_4[Fe(CN)_6] + 2FeSO_4 = Fe_2[Fe(CN)_6] + 2K_2SO_4$

$3K_4[Fe(CN)_6] + 4Bi(NO_3)_3 = Bi_4[Fe(CN)_6]_3 + 12KNO_3$

$K_4[Fe(CN)_6] + 2CuSO_4 = Cu_2[Fe(CN)_6] + 2K_2SO_4$

7."Concealing green paper". A green-colored piece of paper is written with a water solution of a nickel cupboard and is written as "NiSO4*7H2O – green, NiSO4 is yellow" and dried at room temperature. In the green background, the writing is almost unknown. If the places where the paper has writing are heated in flames, a yellow letter appears. Shortly thereafter, the recording will not be visible again in exchange for pulling the moisture in the air. These changes are based on the fact that nickel salts have different colors in aqueous and dehydrated form.

One writes, and the other deletes Three readers appear on stage. One has a piece of paper in his hand, large stacks of paper covered with a little cardboard in the hands of the other two students (stacks 1 or 2 liters in size). The first reader turns the paper in his hand and shows it to the audience and convinces them of the cleanliness of the paper. Then he puts that paper in the student's glass standing next to him. When you close the glass's mouth and wait a little, a reddish-brown inscription "Hello!" appears on the surface of the paper. When pulling the paper out of the glass, its back is shown to the observers. The words "Goodbye, stay fine!" are deceiving. The same side of the paper is drawn to the audience and lowered into the glass in the hand of the third reader. It is observed that the mouth of the glass is immediately covered and the writing on the paper is slowly erased. It is desirable to discuss the reasons for this change in conjunction with your audience.

Note. The notes on both sides of the paper were written and dried before the experiment with a 1% solution of phenolftalein in alcohol. After the alcohol evaporates, the phenolftalein particles remain on the paper surface in the form of a "secret" inscription. At the bottom of the first glass was a concentrated solution of a small amount of ammonia. In ammonia vapor, the color of the indicator (phenolftalein) changes (reddish-brown) paper writing appears because ammonia produces a weak alkaline environment on the surface of a piece of paper. The second glass had been poured slightly out of a concentrated solution of acetic acid. In exchange for neutralization of freshwater (ammonia) of acid vapors, the indicator is colored again and the writing is "extinguished."

$NH4OH = NH3 + H2O$

$NH4OH = NH4+ + OH^-$

$CH3COOH = CH3COO^- + H+$

$NH4OH + CH3COOH = CH3COONH4 + H2O$

$NH3 + CH3COOH = CH3COONH4$

Chemical surgery is widely said about miracles in folk tales and ancient myths. Witches and sorcerers treat the killed soldiers first by spraying "kill" and then "resurrecting" water so that the bleeding stops and the wound heals. Chemists cannot bring the dead soldiers back to life, but they are able to lose the bleeding wound without leaving any trace.

If you can use "resurrecting" and "killing" water, there is no doubt that the witch and the mourner will be left behind (of course, this is a joke!). To show your art to viewers, prepare solutions of pre-iron - (III) chloride, (10 g of salt per 90 ml of water), ammonium tiosianate - (5 g of salt per 95 ml of water) and sodium fluoride (5 g of salt per 95 ml of water). Again, good friends who believe in a "medical miracle" and self-sacrificing people who are "ready to sacrifice" themselves for experience are needed. At the very least, an experimenter can try it out on his own. For this purpose, the arm is used from the arm from the arm to the arm, from the arm to the palm, or from the paws.

Initially wet cotton with "alcohol" (in fact, it would be ammonium tiosianate). Then the surgical blade is disinfected in "iodine". The role of iodine is iron - (III) chloride, a solution. Glass or wooden stick can be used in place of a surgical knife (scalpel). And now we will "cut it." We touch the "surgical knife" where the skin is cleaned with "alcohol," from which the "blood" begins to flow. Then "the wound will be completed." To do this, a solution of sodium ftorid (it plays the role of "living water") is rubbed into a "wound". "Blood" disappears, and healthy skin remains at its bottom. That's the bori of experience. Do not forget to thoroughly wash the "operated" hand so that there is no trace of the reactive.

Iron chloride - (III), interacts with ammonium tiotsianate. The resulting embryo was allowed to develop in nutrients and then inserted into her womb, where it implanted. And its appearance will be very similar to the color of the blood. During the experiment, the following reaction occurs:

$FeCl3 + 3H2O + 3NH4NCS = [Fe(H2O)_3(NCS)_3] + 3NH4Cl$

Ftorid ions create a very tightly colored complex - tetraftorodiacvaferrat (II)-ion - under the influence of tioanalytic complexes of iron:

$[Fe(H2O)_3(NCS)_3] + 4NaF = Na[Fe(H2O)_{2F4}] + 3NaNCS + H2O$

The conclusion is that teaching chemistry through interesting experiences in teaching can allow students to gain interest in this area and to fully master the subject.

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