Teaching Chemistry Based on Experiments

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ABSTRACT

In the process of teaching chemistry, this article helps to increase students' interest in science and strengthen their chemical knowledge based on experiments, and further improve their skills and qualifications.

Keywords: substances, glass rod, Kipp's apparatus, nitric acid, mixture, "fire-bomb", sodium peroxide, iron spoon, saltpeter, "fire dance"

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.

Deletes it, burns it

Many people are not impressed by the idea that carbon dioxide is a combustion product because it does not help burn. However, there are substances that continue to burn under the influence of carbon dioxide, just as in oxygen. The saying that the substances burn in carbon dioxide sounds abnormal to some. If so, it is unhealthy for students to display substances that are turned off and burning in carbon dioxide.

Pour marble or gray, diluted chloride acid over the hope (1:4) and collect the separated carbon dioxide into three tablespoons. Cover the mouth of the containers with cardboard or glass plates. By lowering the burning tip of the pig into all three containers, you can find out that gas is filled in the container and that carbon dioxide does not help many substances (including the pig) to burn.

Wrap a little cotton around the tip of the glass stick, soak it with alcohol and burn it and drop it in one of the gas-filled containers. The flames will be extinguished.

Screed the magnesium tape with a clamp and lower it into the second of the carbon

dioxide containers, too. Magnesium continues to burn, producing white-collar magnesium oxide and black particles.

Take a little red phosphorus into an iron spoon and burn it and lower it into a red container filled with carbon dioxide. Phosphorus also continues to burn. Note that in this case, blackness is less produced.

The equations of chemical reactions related to this experiment can be written as follows:

CaCO3 + 2HCl = CaCl2 + H2O + CO2

2Mg + CO2 = 2MgO + C

P4 + 6CO2 = P4O10 + 2CO + 4C

Note: carbon dioxide can be produced in the Kipp apparatus.

Dance of fire

Ammonium, potassium, sodium, calcium, and barium salts of nitrate acid are called nitrates. Like all salts of nitrate acid, the nitrates break down when heated. However, depending on the nature of the cations that are part of their salts, the processes of breakdown vary. Here are some examples.

NH4NO3 → NO + 2HO

2KNO3 → 2KNO + O

$2Pb(NO3)_2$ → 2PbO + 4NO

Carbon monoxide is a entity used by Jehovah's Witnesses in your country.

Place potassium nitrate for a fifth of the dry probe and heat it vertically into the state. When the salt is liquidated (the potassium nitrate is liquidated at 334 degrees Fahrenheit), the gas bubbles begin to come out. Insert a piece (wood or pistachio) of coal into a probe by sinking it in a gorelka on a pole that holds it with a clamp. Stop heating up. Coal jumps in the probe and burns with a bright flame. The "dance of fire" continues until the coal burns out.

A similar experiment can be conducted with sulfur and red phosphorus. They are heated first and then thrown into the liquid.

C + O2 = CO2

S + O = SO

P4 + 5O2 = P4O10

Note: A container of sand should be placed under the probes because under the influence of combustion temperature, the probe can be broken or liquidated (especially when phosphorus is burned). Burning coal can sometimes fly out of the probe, so it is good to put a lid on the probe's mouth from a wire net.

Yonuvchi pufaklar

If silan is released into the air, one of the hydrogen compounds of silicon will be burned by air oxygen:

SiH4 + 2O ? SiO + 2HO

To obtain this gas, you need a magnesium compound of silicon - magnesium silicide.

To get magnesium silicide, you can choose one of the following methods:

1) Mix the probe with magnesium powder and small quartz sand in a 2-3 weight ratio. If there is no quartz sand, ordinary pure sand can be used. Install the probe in the state and heat the mixture, and when the probe becomes dry, the reaction begins. During the reaction, a lot of heat comes out. So now take the gorelka away. During the removal of fire, magnesium oxide, amorphous silicon, and magnesium silicide are produced:

2Mg + SiO2 = 2MgO + Si

4Mg + SiO2 = Mg2Si + 2MgO

Si + 2Mg = Mg2Si

When the probe is cooled, break it in the air and pour the produced fragments into a larger glass and put them in a diluted (1:1) solution of chloride acid poured into a larger glass. As the separated silan climbs into the air, the liquid produces white smoke on its face and burns charcoal:

Mg2Si+ 4HCl =2MgCl + SiH4

(2) In May, 1.5g of quartz sand is mixed with 2g of magnesium powder and spread over a brick or ceramic plate. Prepare the second mixture of bertole salt with an equal amount of sugar and spread it ohista on top of the first mixture. If 1-2 acid is poured over these mixtures using a long pipette, they burn in exchange for a intense reaction. If the yield is poured into the droplet concentrated sulfuric acid, it burns in exchange for a intense reaction. The resulting magnesium silicyl beads are separated from the chloride acid solution (1:1) and burn in the air.

KClO3 + Na2SO4 = K2SO4 + 2HClO3

2HClO3 = 2ClO + HO + O

12ClO2 + C12H22O11 → 12COO +11HO + 6Cl

The combustion heat of sugar is used for the interaction of sand and magnesium.

(3) A mixture of 3g of sand and 7g of magnesium is poured into the pipe and a magnesium lens is attached in the middle of it. When the lens is burned, magnesium silicide is formed.

Note: When working with Bertole salt, it is important to be careful because even if combustible substances (paper, coal, etc.) are slightly mixed into it, a powerful explosion can occur during friction or heating. It is not recommended that you crush, burn, and prepare these salt-added mixtures on paper.

If boiled, it will burn

With a mixture of high molecular hydrocarbons that store 20 to 28 carbon atoms in a straight chain, paraffin is liquidated between 36 and 55^{oC}. Where the air is enough, heated paraffin burns until it boils, as its flammation temperature is lower than the boiling temperature.

Put pieces of paraffin in a third of the probe and heat until it is boiled. Put cold water in a larger bank crystallizer and pour the boiling paraffin into the water in a thin stream about 20 cm high. When paraffin flows out of the probe, it bursts into flames and turns off when it reaches the water. Paraffin cannot burn because there is not enough oxygen in the probe. When the boiling paraffin comes out into the open air, its vapors immediately begin to burn:

2C20H42 + 57O2 = 36CO2 + 42H2O + 4C

C28H58 + 34.5O2 = 20CO2 + 29H2O + 8C

Paraffin contains 80-90% carbon dioxide, and the amount of oxygen contained in the air is not enough for it to be fully oxidized. Therefore, the flames of paraffin become clearer and burn in exchange for the sinking of carbon dioxide particles that have not been oxidized.

Water and "fire-bomb"

Under the influence of powerful oxidizing, many substances burn very quickly. For such processes to begin, the initial impulse - the effect of catalysts - is enough.

(a) The resulting peroxide and the dried wooden sheet are mixed at 2:1. The intermolecular force from all these filaments is more than the gecko's body weight—when it is skittering upside down across a globe! The mixture burns instantly.

(b) An equal amount of sodium peroxide and aluminum powder are mixed (be careful). Pouring on a non-combustible bottom, water is poured with a long pipette. A bright and powerful flame rises.

Note. Carbon monoxide is a entity used by Jehovah's Witnesses in your country. The resulting embryo was allowed to develop in nutrients and then inserted into her womb, where it implanted. The separation of large amounts of heat, volume expansion and intensity of reactions are effective for "fire-bombing". Components that are part of the mixtures must be pre-dried. Prepared mixtures should be burned immediately, that is, not preserved.

Available literature

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