

Title: Pharaoh's serpent

Work instructions

Task: The thermal decomposition of potassium dichromate and potassium nitrate, coupled with the subsequent caramelization of the sugar, produces a creeping mixture imitating a snake.

Theory

The thermal decomposition of these chemicals produces oxygen:



Some of the oxygen produced oxidises the sugar to caramel and therefore the "snake" is brown in colour and some of the oxygen remains with the products in the resulting mixture, giving the resulting mixture a much higher volume which causes the "snake to slither".

Equipment: mortar, plastic syringe (20 ml), wire gauze, tripod, burner, spoon, annealing dish

Chemicals: potassium dichromate, potassium nitrate, sugar

Procedures:

1. Put 2 g of potassium dichromate, 1 g of potassium nitrate and 3 g of sugar in a mortar.
2. Grind and mix everything thoroughly so that the mixture has an overall yellow colour.
3. Push the mixture thus prepared into the syringe and give it a good push with the plunger so that the mixture is very hard.
4. Transfer the syringe to the fume hood where you have prepared the annealing dish. Cut the end off the syringe and squeeze the mixture into the annealing dish. Light the resulting cylinder in the annealing dish with the match and observe the "snake" coming out. If the mixture cannot be ignited, you can add a few drops of ethanol for faster ignition.

Name of the project: Digitization of chemistry experiments to improve the quality and support chemistry teaching in secondary schools
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Management of chemical substances

Chemicals	Form	H-statements	P-statements
$K_2Cr_2O_7$	Solid	H350, H340, H360, H272, H330, H301, H312, H372, H314, H334, H317, H410	P201, P280, P301 + P330 + P331, P305 + P351 + P338, P304 + P341, P308 + P313
KNO_3	Solid	H272	P220
Saccharose, commercial	Solid	---	---

Sources of risk and assessment of risk severity

Possibility of skin burns and eye damage.

Waste management method

Certified chemical waste disposal company.

Risk reduction measures

Lab coat, goggles, gloves.