Briefing Sheet: Volcano Team

Make an erupting volcano with Ammonium Dichromate

Important Safety Note

Ammonium Dichromate is a Category 2 carcinogen if inhaled. Part 2 of this demonstration should only be carried out by experienced Science Teachers or Technicians and only performed in a Fume Cupboard.

Please consult your employers Risk Assessments and Health and Safety Guidelines for the use of Ammonium Dichromate before attempting the demonstration. Safety recommendations can be found on your employers CLEAPS Hazcards, or SSERC recommendations if in Scotland.

The equipment you will need:

Part 1

- Chicken wire or screen wire
- Empty Baked Bean tin or other flame resistant container
- Wire cutters (scissors)
- Newspaper cut into strips
- Flour
- Water
- Plaster of Paris
- Brown, Green or Grey Paint

Part 2

- Fume Cupboard
- A little ethanol
- Wooden splint
- 10g Ammonium Dichromate
- Blue cobalt chloride paper.

Steps:

Part 1 Student or Teacher

a. Form the wire to resemble a volcano shape, leaving a hole in the top for the Baked Bean tin or another flame resistant container. A good size for the volcano is about a 30 cm diameter across the base.

b. Insert the flame resistant container into the top of the model.

c. Cover the wire with paper mache (layer newspaper with a paste made from flour and water).

d. Leave to dry.

e. Cover the paper mache with plaster of Paris to make it more fireproof especially near the top of the cone. You may scratch in ravines and depressions before the plaster hardens.

f. Make sure that all the paper is well covered with the plaster. Plaster has a natural tendency to shrink and crack, adding realism to the surface of the model.

g. Use paint to illustrate rocks, trees, and whatever else you think is on the sides of a volcano.

h. Leave to dry.

Part 2 Teachers Only

a. Once the Volcano is dry place it in a Fume Cupboard on Heat Proof mats.

b. Place about 10 grams of ammonium dichromate into the flame-resistant container at the top of the volcano.

c. Soak about a length of wooden spill in ethanol and stick this into the top of the pile so that it protrudes to act as a wick. Light the wick. Alternatively, use a roaring Bunsen burner to light the ammonium dichromate.

Description

The ammonium dichromate will burn fiercely for between 30 seconds and one minute. It will produce large volumes of chromium oxide as greyish green ash, and orange sparks shooting upwards. The ash has a considerably larger volume than the original compound.

As the 'volcano' burns try to position a watch glass above the 'volcano'; this becomes steamed up with water from the decomposition. Confirm that this is water with blue cobalt chloride paper.