KS4 Chemistry

Activity Sheet 2 (Revised September 2026)

Black Powder

Black powder was invented by the Chinese over 1200 years ago and was used for the first time in Britain at Ecton mine over 400 years ago. If used in guns it is called gun powder.

Black powder consists of:

- Sulphur (S) – makes the reaction faster and more vigorous. It comes from volcanoes.
- Charcoal (C) – supplies carbon for the reaction. Wood charcoal is best, made by heating Buckthorn or Willow in a charcoal oven.
- Potassium nitrate (KNO_3) – supplies oxygen for the reaction. It comes from seabird or bat guano and is also found as a rock called saltpetre.

The reaction is extremely fast, very exothermic (the combustion temperature is over 2000^{o}C) and it produces lots of gas.

Commercial black powder is 75% by weight potassium nitrate, 15% carbon and 10% sulphur. The ingredients need to be well mixed.

Instructions

You are going to make 10g.

EYE PROTECTION MUST BE WORN

- Weigh 7.5g of potassium nitrate and use a pestle and mortar to grind it to a fine powder.
- Separately weigh 1.5g of carbon. Do NOT grind this.
- Separately weigh 1.0g of sulphur. Do NOT grind this but break up any lumps with a spatula.
- Gently mix the three ingredients on a piece of scrap paper. DO NOT GRIND THE MIXTURE OR USE METAL APPARATUS.
- Place a fuse in a cardboard tube sealed at one end with tape, then carefully pour the mixture into the tube.
- The tutor will ignite your black powder outside.

Note: the powder will only explode if the gases cannot escape.