

Don't go breakin' (down) my (love) heart

Education in Chemistry

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Technician notes

Kit

- tin lid or ceramic evaporating basin
- sand
- heat resistant mat
- 2 cm³ ethanol or IDA (industrial denatured alcohol)*
- mixture of 4 g sucrose and 1 g sodium hydrogen carbonate **or** 5 'fizzer' tablet sugar sweets (approximately 5 g). Examples include Love Hearts, Giant Fizzers, Refreshers – look for sodium hydrogen carbonate or sodium bicarbonate in the ingredients

* **Note: This is highly flammable.**

Preparation

Place a pile of sand on a tin lid or evaporating basin a few centimetres in depth in order to create a well for the sugar/sodium hydrogen carbonate mixture or the sweets. Place the mixture or sweets into the well.

In front of the class

Wear eye protection. Add 2 cm³ of ethanol or IDA to the mixture and light it. The ethanol burns off initially with a colourless flame. Soon after, the sugar begins to caramelize and decompose (producing steam and carbon) while the sodium hydrogen carbonate decomposes (producing carbon dioxide). Over the next minute, a black 'snake' of carbon climbs out from the mixture or the sweets.

Unlike the snake produced by the dehydration of sugar by sulfuric acid, the product is safe to handle and the reaction can be safely performed in a well-ventilated room rather than a fume cupboard.

Health and safety and disposal

Wear eye protection. The product is safe to handle when cool and can be disposed of in the bin.

In some lighting conditions the ethanol flame may be difficult to see – do not be tempted to add more ethanol to the mixture after attempting to light it.