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| Simple Chemical Reactions  This reaction can be applied to curriculum for excellence.  *Through experimentation, I can identify indicators of chemical reactions having occurred. ...*  **SCN 3-19a**  N4 Chemical Changes and Structure  *- Rates of Reaction*  N5 Chemical Changes and Structure  *- rates of reaction*  CfE Higher – Nature’s chemistry  *Oxidation of food* |
| Briggs Rauscher reaction |

To show changes in appearance in chemical reactions



**It also makes an eye catching demonstration for an open evening/parents’ night.**

## Background

This oscillating reaction is known as the Briggs-Rauscher (BR) reaction. The mechanism is very complex and involves iodide ions and iodine molecules. It is thought that the colourless solution arises when I2 is low and I– is high; it is yellow when I2 is high and I– is low; and blue when I­2 and I‑ concentrations are high (when both are high they form pentaiodide ions which give the blue complex with starch). The changes in the relative concentrations of the I­2 and I‑  are brought about by the species HOI. As its concentration rises and falls, it triggers oscillations in the I– and I2 concentrations.

## What you will need

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| 100 volume hydrogen peroxide solution | Manganese(II) sulphate |
| Potassium iodate | Distilled water |
| 0.1M Sulphuric acid | 4 x 250 ml Beakers |
| Soluble starch | 3 x 50 ml measuring cylinders |
| Malonic acid | Stirring rod or magnetic stirrer with follower |
| Balance |  |

**What you do**

**Prepare three solutions as follows.**

**Always use distilled water. Chloride ions in tap water can interfere with the reaction.**

**Solution 1:** Weigh out 4.3g of potassium iodate and dissolve in 100 cm3 of 0.1M sulphuric acid in one of the beakers.

**Solution 2:** Prepare 100 cm3 of a 0.1% solution of soluble starch.

Weigh out 1.5g malonic acid and 0.4g magnesium sulphate and dissolve these in the cold starch solution.

**Solution 3:** Prepare 100 cm3 of a 9% solution of hydrogen peroxide by diluting 30 cm3 of 100 volume hydrogen peroxide to 100 cm3 with distilled water.

**The demonstration**

# You will need

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| 100 cm3 glass beaker x 1 | 50 cm3 beaker (or other container) x 3 |
| 10cm3 syringe x 3 | Timer |
| Solutions A, B and C | Stirring rod or magnetic stirrer with follower |

# What you will do

1. Decant solutions A, B & C into three small beakers – so you can fir the syringes in.
2. Using a syringe place 10 cm3 of solution A into a 100cm3 beaker.
3. Using a 2nd syringe add 10 cm3 of solution B to the same beaker and place on top of the magnetic stirrer.
4. Turn on the stirrer and using the 3rd syringe , add 50 cm3 of solution C to the same beaker.
5. Record the time from the start of the 2nd to the start of the 3rd blue colour appearance.

Empty the contents of the beaker into the waste disposal bottle

*\* Any volume will do – as long as you have equal volumes of all three solutions*

**Safety**



Wear eye protection Wear gloves



Care with bleach–Irritant

**It is the responsibility of teachers doing this demonstration to carry out an appropriate risk assessment.**