

## Microscale redox reactions – student sheet

In this experiment you will be observing and interpreting two redox reactions.

### Part 1: the reaction between copper(II) ions and halide ions

#### Instructions

1. Cover table 1 with a clear plastic sheet.
2. Put one drop of copper(II) sulfate solution in each of the boxes below.
3. Add one drop of sodium chloride solution to the first box; one drop of potassium bromide solution to the second box; one drop of potassium iodide solution to the third box. Observe.
4. Add one drop of starch solution to each of the reaction mixtures. Observe.

Table 1

	Sodium chloride solution	Potassium bromide solution	Potassium iodide solution
Copper(II) sulfate solution			

#### Question

What explanation can you give for your observations?

### Part 2: the reaction between silver(I) ions and iron(II) ions

#### Instructions

1. Cover table 2 on your worksheet with a clear plastic sheet.
2. Put one drop of silver nitrate solution in the box below.
3. Add one drop of iron(II) solution. Observe closely. What happens?
4. After one minute add one drop of thiocyanate solution.

Table 2

	Iron(II) solution
Silver nitrate solution	
	Thiocyanate solution

5. To help you interpret your observations, put one drop of potassium thiocyanate solution in each of the boxes in table 3 on your worksheet. Add one drop of each of the reagents indicated and observe.

**Table 3**

	<b>Silver nitrate solution</b>	<b>Iron(II) solution</b>	<b>Iron(III) solution</b>
<b>Potassium thiocyanate solution</b>			

### Question

What explanations can you give for your observations?

### Health, safety and technical notes

- Wear eye protection throughout (splash-resistant goggles to BS EN166 3).
- Potassium bromide, KBr (aq), 0.2 mol dm<sup>-3</sup> is low hazard.
- Iron(II) sulfate, FeSO<sub>4</sub>.7H<sub>2</sub>O (aq), 0.2 mol dm<sup>-3</sup> is low hazard.
- Iron(III) nitrate, Fe(NO<sub>3</sub>)<sub>3</sub>.9H<sub>2</sub>O (aq), 0.2 mol dm<sup>-3</sup> is low hazard.
- Potassium thiocyanate, KBr (aq), 0.1 mol dm<sup>-3</sup> is low hazard.
- Potassium iodide, KI(aq), 0.2 mol dm<sup>-3</sup> is low hazard.
- Silver nitrate, AgNO<sub>3</sub>(aq), 0.1 mol dm<sup>-3</sup> is an eye IRRITANT. Keep separate from organic waste containers.
- Copper(II) sulfate solution, CuSO<sub>4</sub>(aq), 0.2 mol dm<sup>-3</sup> causes eye damage and is HAZARDOUS to the aquatic environment.