Micro Electrolysis

Set up a circuit using either a 9v battery or a power supply set to 9v.

You need 2 electrodes held with crocodile clips – pencil leads are ideal.

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| **1.Starch / Potassium iodide** | 1. **Tin II chloride** |
| Place the electrodes into the solution.  Add 1 drop of phenolphthalein solution. | Place the electrodes into the solution. |
| **3. Sodium sulphate** | **4. Sodium chloride** |
| Place the electrodes into the solution.  Add a drop of food colouring and stir. | Place the electrodes into the solution.  Add a drop of food colouring and stir. |
| **5. Sodium chloride** | **6. Silver nitrate** |
| Place the electrodes into the solution.  Add 1 drop of phenolphthalein solution. | Place the electrodes into the solution. |

Place drops of different solutions to fill the circles below and follow the instructions.

**Micro Electrolysis - Explanation**

1. You see blue/black colour appearing at the positive electrode where iodide ions are being oxidised to iodine

2I- 🡪 I2 + 2e-

At the other electrode, you see bubbles, and when phenolphthalein is added you get a purple colour, signifying alkaline conditions – due to the OH ions.

H2O + 2e- 🡪 H2 + 2OH-

1. At the negative electrode tin ions are reduced to metallic tin

Sn2+ + 2e-  🡪 Sn

At the other electrode,

H2O 🡪 2H+ + 2e-

1. You see bubbles appearing at the negative electrode where iodide ions are being reduced to iodine

H2O + 2e-  🡪 H2 + 2OH-

Addition of blue food colour has no effect.

1. You see bubbles appearing at the negative electrode where chloride ions are being reduced to chlorine

2Cl- 🡪 Cl2 + 2e-

When blue food colour is added, the colour disappears as it is bleached by the chlorine. You may also be able to smell the chlorine gas.

1. You see bubbles appearing at the negative electrodea gain where chloride ions are being reduced to chlorine

2Cl- 🡪 Cl2 + 2e-

This time, when phenolphthalein is added you get a purple colour, signifying alkaline conditions – due to the OH ions.

H2O + 2e- 🡪 H2 + 2OH-

1. You see bubbles appearing at the positive electrode where oxygen is being produced

4OH-  🡪 H2O + O2 + 4e-

At the negative electrode, you see silver forming.

Ag+ + e- -  🡪 Ag