NEATH PORT TALBOT COLLEGE
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School of Maths & Science
Science Practical

Internal resistance and EMF of a cell

◆ Aim

To determine the internal resistance and EMF of a 1.5V cell.

◆ Introduction

You will vary the p.d. across a resistor and measure the corresponding current through it. From a graph of p.d. against current the resistance may be determined.

◆ Safety

Control Measures
- You are reminded of the need for good laboratory practice in order to maintain a safe working environment.
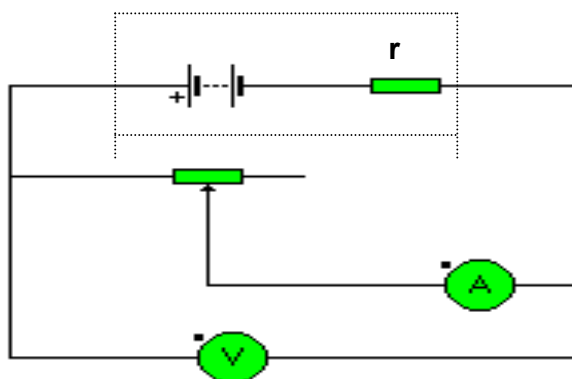
Hazards

- **Electrical hazard**

  Take care with circuits. Switch off power before connecting and disconnecting the circuit.

◆ Procedure

1. Set up the circuit as shown above. The 'internal resistance' of the supply is being represented by a series resistor (r) in the circuit to ensure a positive experience.

2. Alter the resistance of the variable resistor and record the current reading on the ammeter and corresponding voltage across the variable resistor and ammeter in the table below.

V_1 (V) V_2 (V)	V_{av} (V)	I_1 (mA) I_2 (mA)	I_{av} (mA)

3. Plot a suitable graph of voltage against current using the data above, putting voltage on the y-axis, and current on the x-axis.

4. Use the graph to calculate the internal resistance (r) and the EMF of the supply. Justify the number of significant figures used in your final answers.

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5. Determine the percentage uncertainty in EMF.

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6. Determine the percentage uncertainty between the experimental value of EMF and the manufacturers value of 1.5V.

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7. Comment on the accuracy and reliability of the experiment.

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8. Suggest some of the limitations of the experiment, and for one limitation discuss the effect it may have on the experimental value of EMF.

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