

NEATH PORT TALBOT COLLEGE COLEG CASTELL NEDD PORT TALBOT

School of Maths & Science Science Practical

Resistivity of Conducting Paper

◆ Aim

To determine the resistivity of a length of conducting paper.

◆ Introduction

You will vary the length of a piece of conducting paper included in an electrical circuit. Then measure the corresponding current through it and voltage across it. You will plot a suitable graph to determine the resistivity of the paper.

◆ Safety

Control Measures

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

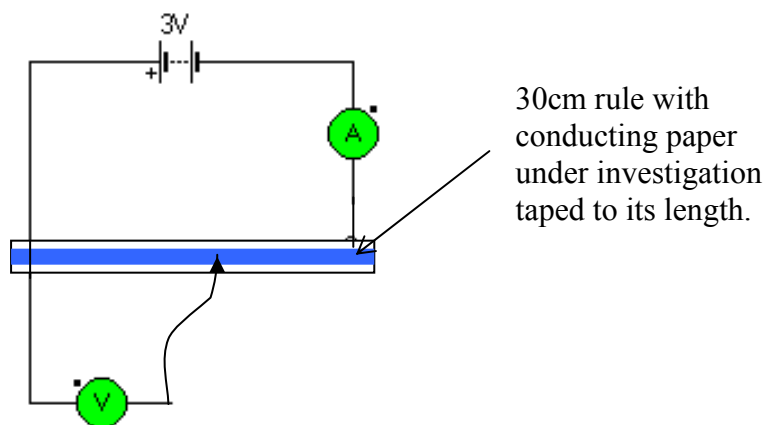
Hazards

- **Electrical hazard**

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



◆ Procedure



1. Set up the circuit as shown above.
2. Vary the length of conducting paper included in the circuit by moving a crocodile clip along its length at regular intervals.
3. Record the length of conducting paper and corresponding current reading on the ammeter and the voltage across the conducting paper in the table below.
4. Measure the dimensions of the conducting paper using vernier callipers.
 _____ Units _____
5. Calculate the cross sectional area of the conducting paper.
 _____ Units _____

6. Plot a graph of resistance (y-axis) against length (x-axis) to enable you to determine the resistivity of the conducting paper under investigation from the gradient of the graph.

7. Show equations used and calculations below to determine resistivity.

8. Justify the number of significant figures for resistivity.

9. Determine the percentage uncertainty in the cross-sectional area A of the paper.

percentage uncertainty _____

10. Determine the percentage uncertainty in ρ .

percentage uncertainty _____

11. Determine the percentage difference between the experimental value of resistivity ρ and the accepted value of the resistivity of $0.2\Omega \text{ m}$.

percentage difference _____

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

13. You have carried out this experiment. Suggest some of the limitations of the experiment and how these can be improved. For one limitation discuss the effect it may have on the experimental value for ρ .
