Resistance Lab

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1. Purpose

For part 1, the goal was to examine how material, cross-sectional area, and length impact resistance. For each coil of wire, resistance was determined in three ways: based on measurements of voltage and current; based on the resistance reading from the multimeter; and based on the dimensions of the wires and the resistivity of the material. In addition, the results of the three methods of determining resistance were compared.

2. Results

Table 1 contains the properties of the resistance coils used in part 1. ρ is the resistivity of the material. L is the length of the coil of wire. D is the diameter of the wire.

Table 1. Resistance Coils

Coil	Material	ρ (Ω m)	L (cm)	D (cm)
1	Nickel-Silver	44×10^{-8}	40	0.0254
2	Nickel-Silver	44×10^{-8}	80	0.0254
3	Nickel-Silver	44×10^{-8}	120	0.0254
4	Nickel-Silver	44×10^{-8}	160	0.0254
5	Nickel-Silver	44×10^{-8}	200	0.0254
6	Nickel-Silver	44×10^{-8}	200	0.0320
7	Copper	1.72×10^{-8}	2000	0.0254

3. Uncertainty

4. Conclusion

5. Citations

[1] Karen Schnurbusch, *Physics 4B Lab Book*, Mt. San Antonio College, 2023, pp. 65-70.
[2] Karen Schnurbusch, *Physics 4B Equations*, Mt. San Antonio College, 2023, pp. 4, 10.