

Physical Properties of Elements

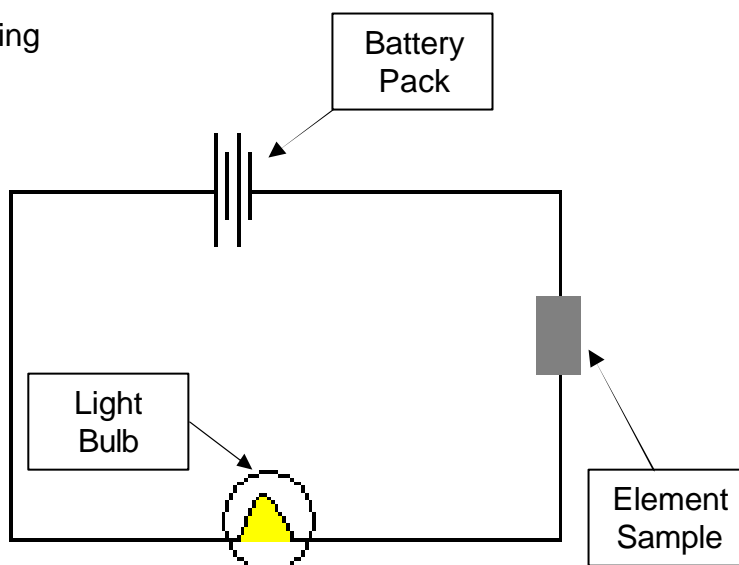
Aim: To compare the physical properties of some elements. These properties include its state at room temperature, electrical conductivity, melting point, lustre, malleability & hardness. Then determine whether they are metals or non-metals.

Equipment:

- Hammer
- Alligator clips and wires
- Light bulb
- Battery Pack
- Steel wool
- Stainless steel knife
- Various Elements for testing

Method:

1. Gathered equipment
2. Chose first element and cleaned it with steel wool to determine lustre.
3. Hit element with hammer to determine its malleability. Whether it was highly malleable or brittle.
4. Scratched element sample with stainless steel knife to determine its hardness.
5. Set up a circuit (as in diagram) with battery pack, light, alligator clips and element sample to determine its conductivity. If the light came on, then the sample conducted electricity.
6. Recorded results.
7. Repeated steps 2 to 6 for each of the elements Al, Fe, C, Sn, Pb, Mg, Cu, S & Zn.



Results:

Element Sample	Lustre	Electrical Conductivity	Malleability	Hardness
Al	Shiny	Yes	High	Very Soft
Fe	Shiny	Yes	Low	Very Hard
C	Dull	Yes	Low	Soft
Sn	Shiny	Yes	High	Soft
Pb	Shiny	Yes	Low	Soft
Mg	Shiny	Yes	High	Soft
Cu	Shiny	Yes	High	Soft
S	Dull	No	Very Low	Very Soft
Zn	Shiny	Yes	Medium	Medium

Calculations:

Element Sample	Group
Al	Metal
Fe	Metal
C	Non-metal
Sn	Metal
Pb	Metal
Mg	Metal
Cu	Metal
S	Non-metal
Zn	Metal

Conclusion: Of the nine elements tested, seven were metals and two were non-metals. However, one non-metal, Carbon, did in fact, conduct electricity. This is a trait of a metal but is not enough to classify it as a semi-metal.

Evaluation: Overall, this experiment had a high success rate. But the malleability part of this experiment was inconclusive in proving whether a material was a metal or a non-metal.

The lustre experiment was a good one in proving whether it was a metal or a non-metal. All the shiny metals were able to be classed as metals straight away which helped speed up the rest of the experiment.