

Determining bond type of unknown substances essay sample

[Science](#), [Chemistry](#)



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Purpose:

The purpose of this lab was to determine the type of bonding in some unknown substances based on their physical properties.

Table of Properties:

Properties

Ionic

Molecular

Electrical Conductivity of the compound in aqueous solution

Conduct

Don't Conduct

Melting and Boiling points

High

Low

Electrical Conductivity of the compound in liquid form

Conduct

Don't Conduct

Hardness

Hard

Soft

Polar solvents

Can dissolve ionic compounds that ionize.

Can dissolve covalent compounds that ionize.

Procedure:

* Test one: Hardness

* Test two: Dissolve in water and see if it conducts electricity

* Test three: Heat up to see how fast it will melt or boil

1) Carefully read the directions first

2) Gather Materials

– Test tubes, several unknown compounds, conductivity testers, oil, wooden stirring sticks, water, Bunsen burner, test tube racks, goggles.

3) Put on Safety Equipment (goggles)

4) Perform Test One by pressing compounds to see how hard/soft it is

5) List Observations

6) Perform Test Two by getting 4 cups of 20 mL of distilled water

- 7) Measure out a small quantity of each substance
- 8) Then put each substance into different cups of water
- 9) Stir them out
- 10) Test the conductivity of the compounds using the conductivity testers
- 11) List Observations
- 12) Perform Test Three by lighting the Bunsen Burner
- 13) Put a little bit of each compound into separate test tubes
- 14) Hold the test tube over the Bunsen Burner flame and Heat for 30 secs
- 15) List Observations
- 16) Clean the lab area
- 17) By using Data, Determine the bond type (Ionic or Molecular) for each compound

Data:

A

B

C

D

Hardness

Very soft, powdery

Soft, harder than A

Soft

Hard when clumped but soft when powdery

Conductivity

Doesn't conduct

Doesn't conduct

Conducts electricity

Conducts electricity

Melting/Boiling

Boiled and melted very quickly

Melts and boils quickly

Doesn't melt, Doesn't boil

Condensed & clumped

Polarity

Dissolves

Doesn't dissolve

Doesn't dissolve

Doesn't Dissolve

Conclusion:

The purpose of this lab was to determine the type of bonding in some unknown substances based on their physical properties. To start-off, the group gathered required materials, performed the tests, listed observations and cleaned the lab. Afterwards, it determined the bond type of unknown substances. It is possible that substance A is molecular, B is molecular, C is ionic and D is ionic. A is molecular because the compound melted and boiled at much lower temperature (took milliseconds to melt) than ionic compounds did (C and D). It also dissolved in oil and did not conduct electricity in solution. On top of that, it is very soft because covalent compounds are frequently flexible rather than hard. It is also promising that B is molecular.

It did not conduct electricity, melted and boiled at a low boiling point, and was soft when felt. Although it did not dissolve with oil, all other collected data suggests that it is, most likely, a molecular bond. It is determined that substance C is ionic because it did not melt/boil or change physical appearance. It conducted electricity but did not dissolve. Despite the fact it is soft; the is harder than molecular substances. D is ionic because it's hard, conducted electricity in solution state, did not melt or boil but rather condensed and clumped and it did not dissolve in oil. To improve the lab, the

team could perform more tests to make it much easier to determine the bond type.