# The properties of substances and their bonding

## Assessed criteria: Criterion C - Processing and Evaluating

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|  | Level descriptor |
| 7-8 | The student is able to: i. **correctly collect, organize, transform and present** data in numerical and/ or visual forms ii. **accurately interpret** data and **explain** results **using correct scientific reasoning** iii. **evaluate** the validity of a hypothesis based on the outcome of a scientific investigation iv. **evaluate** the validity of the method based on the outcome of a scientific investigation v. **explain** improvements or extensions to the method that would benefit the scientific investigation. |

**Objective**

To study, evaluate and compare the properties of several substances and relate them to their type of bonding (ionic, covalent or metallic).

**Theoretical background**

The properties of substances are related to the kind of bonding present in those substances. The type of bonding depends on the atoms present and is related to their position in the periodic table.

**Materials**

Substances A to D Conductivity meter

Test tubes Distilled water

Spatula Acetone

Bunsen burner

**Method**

Repeat the procedure for each of the substances provided:

1. Take ½ a spatula of the substance in a test tube. Describe the appearance of the substance.
2. Gently heat it in the flame of the Bunsen burner and state if the approximate melting point. (*Low, intermediate or high*).
3. Take ½ a spatula of the substance in another test tube.
4. Add 10 mL water, stir it and state whether the substance is soluble in water or not.
5. Repeat the steps 4 and 5 using acetone instead of water.
6. Using the conductivity meter, state if the substance is a conductor in solid state.
7. If it the substance is soluble in water, test whether the solution is a conductor or not.

**Blog tasks**

The whole report must be posted to your group blog. Make sure you include:

1. A table of results.
2. The type of bonding present in each substance.
3. A secondary table to show “expected” results. (*Research the type of bonding and the expected results for the test that you carried out*)
4. A conclusion comparing the actual results with the expected results.
5. An evaluation that suggest improvements that could be made to your method.
6. A minimum of 2 references (*APA format*).