# 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**

For 1 of each of the substance types, carry out the following tests:

**Melting point**:

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 for 2 minutes and state if the approximate melting point. (*Low, intermediate or high*).

**Solubility**:

1. Take ½ a spatula of the substance in another test tube.
2. Add 5 mL water, stir it and state whether the substance is soluble in water or not. (If it **is** soluble then save the solution for step 7)
3. Repeat the step 4 using acetone (*an organic solvent*) instead of water.

**Electrical conductivity**:

1. Using the available equipment to test whether the substance is a conductor in a solid state.
2. If it the substance is soluble in water, test whether the solution is a conductor or not.

***Disposal****: All solids can be placed in the bin and water poured in the sink. Acetone should be poured in the organic waste bin.*

**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*).