**Task 5 : Part A :Chemistry Year 11: Bonding Investigation Validation Test (Total 22 marks)**

**Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. a) Consider the following substances insolution:

**sucrose, NaCl, HCl and NaOH.**

State whichsolutions showed good conductivity (displayed a substantial current, several mA or more).

(3 marks)

*NaCl, HCl, NaOH*

1. What bonding type can you deduce from this? (1 marks)

*Ionic*

1. Explain your reasoning (2 marks)

*Electricity is the flow of charged particles, therefore there must be positive and negative ions in the solutions,*

1. Which solutions showed low conductivity (none or very small current). ( 1 marks)

*Sucrose*

1. What bonding type can you deduce from this? (1 marks)

*covalent molecular*

1. a) Consider the pure substance(s )(not the substances in solutions)
2. State three pure substances that showed no conductivity. ( 3 marks)

*Napthalene, solid NaOH, AgNO3 , candle wax, sulphur*

1. What can you say about its bonding? (2 marks)

*Not metallic ( 2 marks)* *if Covalent molecular or similar (1 mark)*

*2 marks given if explained fully*

b) One of the substances did not conduct electricity in the solid state but did conduct electricity when it melted. State this substance.

*NaOH or AgNO3*  ( 1 mark)

State the type of bonding? (1 mark)

*Ionic*

Explain why this observation occurs? ( 4 marks)

*In the solid state the positive and negatively charged ions (1)are held together by electrostatic forces in a rigid lattice (1)*

*In the liquid state the ions are able to dissociate (1) and therefore become charge carriers and form an electric current (1)*

1. State two safety precautions that you took in the experiment ( 3 marks, ½ mark per section)

|  |  |  |
| --- | --- | --- |
| **Safety**  **precaution** | **Why was it necessary?** | **Which substances was it very important to carry out this precaution and why?** |
| Not touching electrodes | to avoid electrocution | NaCl, HCL, NaOH  As current was high near 1 A |
| Using fume hood | To avoid breathing in fumes, could catch fire | Ag NO3, Sulphur, napthalene |