


# Chemistry Notes

Edexcel IGCSE

## Chapter 1f – Ionic Bonding

1f – Ionic bonding	
1.37 – Understand how ions are formed by electron loss or gain	<ul style="list-style-type: none"> <li>+ = electron loss      – = electron gain</li> <li>When non-metal &amp; metal react, metal loses electron, nonmetal gains                             <ul style="list-style-type: none"> <li>E.g. Na<sup>+</sup> and Cl<sup>-</sup></li> </ul> </li> </ul>
1.38 – Know the charges of these ions:	<ul style="list-style-type: none"> <li><b>Metals in Groups 1, 2 and 3</b></li> <li><b>Non-metals in Groups 5, 6 and 7</b></li> <li><b>Ag<sup>+</sup>, Cu<sup>2+</sup>, Fe<sup>2+</sup>, Fe<sup>3+</sup>, Pb<sup>2+</sup>, Zn<sup>2+</sup></b></li> <li><b>Hydrogen (H<sup>+</sup>), Hydroxide (OH<sup>-</sup>), Ammonium (NH<sub>4</sub><sup>+</sup>), Carbonate (CO<sub>3</sub><sup>2-</sup>), Nitrate (NO<sub>3</sub><sup>-</sup>), Sulfate (SO<sub>4</sub><sup>2-</sup>)</b> <ul style="list-style-type: none"> <li>Learn these on quizlet or something similar</li> </ul> </li> </ul>
1.39 – Write formulae for compounds formed between the ions listed above	<ul style="list-style-type: none"> <li>Any combination is possible, just remember to balance out the charges – should end w/ 0</li> <li>Also if asks for state symbols, DO NOT FORGET THESE – Usually solution + solid</li> <li>E.g. Write reaction between Silver Carbonate and Zinc                             <ul style="list-style-type: none"> <li>Silver is 1+ and Carbonate is 2- so write (Ag)<sub>2</sub>CO<sub>3</sub></li> <li>Zinc is more reactive than Silver so will displace the Silver. However, Zinc is 2+ so need to produce 2 silver atoms per atom of Zinc</li> <li>Zn + (Ag)<sub>2</sub>CO<sub>3</sub> → ZnCO<sub>3</sub> + 2 Ag</li> </ul> </li> </ul>
1.40 – Draw dot-and-cross diagrams to show the formation of ionic compounds by electron transfer	<ul style="list-style-type: none"> <li>Limited to combinations of elements from Groups 1,2,3 and 5,6,7</li> <li>Only outer electrons need to be shown</li> <li>Example: Sodium + Chloride to form Sodium Chloride/Table salt. Sodium is metal, Chlorine is nonmetal:</li> </ul> <div style="text-align: center;">  </div>
1.41 – Understand ionic bonding in terms of electrostatic attractions	<ul style="list-style-type: none"> <li>Nonmetal and metal ions are oppositely charged. Charge difference = strong bond, separated by electrolysis where cations (metal positive) go to cathode while anions (negative NM) go to anode</li> <li>In solids, form a giant lattice structure = each charge is surrounded by opposite charges</li> </ul>
1.42 – Understand why compounds with giant ionic lattices have high melting and boiling points	<ul style="list-style-type: none"> <li>Ionic lattice = regular structure, usually a crystal – conducts electricity when dissolved in water. Covalent molecules are weaker bc inter (between) molecules are weaker than opposite charge</li> <li>Strong bond between one positive ion and all negative ions around it means high temp needed to break – also not only 1 bond, each with everything around</li> </ul>
1.43 – Know that ionic compounds do not conduct electricity when solid, but do when molten and in aqueous solution	<ul style="list-style-type: none"> <li>This is because ions aren't free to move in a solid and are fixed in place = no charge carrier</li> <li>When they are in molten or in solution, ions can slide over one another = charge carriers can move and carry current = conducts electricity</li> </ul>