



- 1 The electrolysis of molten aluminium fluoride produces aluminium (Al) at the negative electrode and fluorine (F<sub>2</sub>) at the positive electrode.
- Explain why solid aluminium fluoride does not conduct electricity but molten aluminium fluoride does.  
**as a solid the ions cannot move to carry charge  
but when molten the ions can move to carry charge**
  - Give the formula of the ions in aluminium fluoride: aluminium ions **Al<sup>3+</sup>** fluoride ions **F<sup>-</sup>**
  - Give the formula of aluminium fluoride: **AlF<sub>3</sub>**
  - Explain why aluminium ions go to the negative electrode. ....  
**aluminium ions are positive and they are attracted to the negative electrode as opposite charges attract**
  - Write a half equation for the formation of aluminium at the negative electrode. **Al<sup>3+</sup> + 3e<sup>-</sup> → Al**
  - Explain whether the formation of aluminium is an oxidation or reduction process.  
**reduction as the aluminium ions gain electrons**
  - Explain whether the negative electrode is the anode or cathode.  
**cathode as this is where reduction occurs**
  - Write a half equation for the formation of fluorine at the positive electrode. **2F<sup>-</sup> - 2e<sup>-</sup> → F<sub>2</sub>**
- 2 Complete the table about the electrolysis of some molten ionic compounds.

molten substance	formula	negative electrode half-equation	positive electrode half-equation
calcium oxide	<b>CaO</b>	<b>Ca<sup>2+</sup> + 2e<sup>-</sup> → Ca</b>	<b>2O<sup>2-</sup> - 4e<sup>-</sup> → O<sub>2</sub></b>
magnesium bromide	<b>MgBr<sub>2</sub></b>	<b>Mg<sup>2+</sup> + 2e<sup>-</sup> → Mg</b>	<b>2Br<sup>-</sup> - 2e<sup>-</sup> → Br<sub>2</sub></b>
sodium chloride	<b>NaCl</b>	<b>Na<sup>+</sup> + e<sup>-</sup> → Na</b>	<b>2Cl<sup>-</sup> - 2e<sup>-</sup> → Cl<sub>2</sub></b>