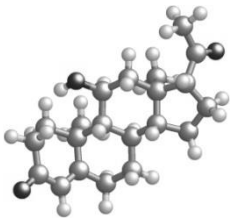

Chem!stry

Name: …… **( )**

Class: ……

Date: …… **/** …… **/** ……

Electrochemistry – Ionic Half-Equations

Write ionic half-equations to describe the chemistry taking place at the anode and the cathode when each of the following substances is electrolysed.

Remember, in general:

- Negative ions (anions) are attracted towards the positive electrode (anode) where they are oxidised.
- Positive ions (cations) are attracted towards the negative electrode (cathode) where they are reduced.

Remember, for aqueous solutions:

- In addition to ions of the solute, aqueous solutions also contain $H^+_{(aq)}$ and $OH^-_{(aq)}$ ions due to ionisation of the water molecules.
- If the solute contains a cation of a metal that is *above* hydrogen in the electrochemical series, *hydrogen* is preferentially discharged at the cathode.
- If the solute contains a cation of a metal that is *below* hydrogen in the electrochemical series, the *metal* is preferentially discharged at the cathode.
- At the anode, $OH^-_{(aq)}$ is preferentially oxidised unless the solution is a concentrated $Cl^-_{(aq)}$, $Br^-_{(aq)}$, or $I^-_{(aq)}$. Other ions, such as CO_3^{2-}, $NO_3^-{}_{(aq)}$ and SO_4^{2-} are not normally oxidised.

1) Molten sodium chloride – $NaCl_{(l)}$

- Anode: ……
- Cathode: ……

2) Molten lead(II) iodide – $PbI_{2(l)}$

- Anode: ……
- Cathode: ……

3) Molten silver bromide – $AgBr_{(l)}$

- Anode: ……
- Cathode: ……

4) Molten aluminium oxide – $Al_2O_{3(l)}$

- Anode: ……
- Cathode: ……

5) Water – $H_2O_{(l)}$

- Anode: ……
- Cathode: ……

6) Dilute aqueous sodium chloride – $NaCl_{(aq)}$

- Anode: ……
- Cathode: ……

7) Aqueous Copper(II) sulphate – $CuSO_{4(aq)}$

- Anode: ……
- Cathode: ……

8) Concentrated hydrochloric acid – $HCl_{(aq)}$

- Anode: ……
- Cathode: ……

9) Aqueous silver nitrate – $AgNO_{3(aq)}$

- Anode: ……
- Cathode: ……

10) Dilute sulphuric acid – $H_2SO_{4(aq)}$

- Anode: ……
- Cathode: ……

- Scan the QR code given below to view the answers to this assignment.

http://www.chemist.sg/electro_chem/ionic_half_equations_ans.pdf