C2 Topic 2 Ionic bonding, properties and electrolysis

Ionic bonding 1	
1. What is an element?	A substance made up of only 1 type of atom
2. What is a compound?	A substance made up of two or more elements that are chemically bonded
3. What are two ways that bonds can form?	Either by sharing electrons (covalent) or giving / taking electrons (ionic)
4. Why do atoms give (or take) electrons?	To gain complete outer shells of electrons
5. What is ionic bonding?	A bond formed when two or more atoms give, or take, electrons to form ions
6. If an atom gives an electron what charge will it have?	Positive
7. If an atom takes an electron what charge will it have?	Negative
8. What forms when an atom gives (or takes) an electron?	An ion
Ionic bonding 2	
9. What do group 1 elements react with?	Non-metal elements (e.g. halogens)
10. What is the name of the structure that forms when from ionic bonding between lots of (millions) atoms?	Giant ionic lattice
11. What holds the ions in a giant ionic lattice together?	Strong electrostatic forces of attraction between oppositely charged ions
12. What charge will a group 1 element have when bonded ionically?	+1
13. What charge will a group 7 element have when bonded ionically?	-1
14. What are the elements in group 7 known as?	The halogens
15. What are the elements in group 1 known as?	The alkali metals
Ionic compounds	
16. What happens to an ionic compound when it is put into water (or melted)?	It dissolves, the ions break apart and are able to move freely
17. Why do ionic compounds have high boiling and melting points?	Because of the strong forces of attraction between ions in a giant ionic lattice
18. Describe the properties of dissolved (or melted) ionic compounds	Ions are able to move freely and so can carry a current, allowing them to conduct electricity
19. Describe the boiling, and melting, points of ionic compounds	High boiling points High melting points

Electrolysis 1	
20. Why do ions go to the oppositely charged electrode?	They are attracted due to the opposite charges
21. Where do negatively charged ions go during electrolysis?	The positive electrode
22. Where do positively charged ions go during electrolysis?	The negative electrode
23. Describe the process of electrolysis	An electric current is passed through an ionic compound either when molten, or dissolved in solution, breaking the compound into elements.
24. What is an electrolyte?	The solution formed when electrolysis is carried out on molten or dissolve ionic compounds
Electrolysis 2	
25. Write a half-equation for the reduction of sodium	$Na^+ + 2e^- \rightarrow Na$
26. What affects which the products formed during electrolysis at each electrode?	The reactivity of the elements involved
27. What happens to ions at the positive electrode?	Oxidation – the ions lose electrons
28. Write a half-equation for the oxidation of chlorine	$2Cl^- \rightarrow Cl_2 + 2e^-$
29. What happens to ions at the negative electrode?	Reduction – the ions gain electrons
Uses of electrolysis	
30. What are the products of electrolysis of sodium hydroxide used form?	Sodium hydroxide – soap production, chlorine – bleach and plastics, hydrogen – manufacturing margarine.
31. What is electrolysis used for?	Electroplating objects e.g. with copper or silver
32. What are the products of electrolysis of sodium chloride?	Hydrogen (negative electrode), chlorine (positive electrode) and sodium hydroxide (in solution)
33. What forms during the electrolysis of aluminium oxide?	Aluminium at the negative electrode Oxygen at the positive electrode which then reacts with the carbon in the electrode to form carbon dioxide
34. What is cryolite?	A chemical used in aluminium electrolysis to lower the activation energy of the reaction, so reducing the amount of energy required