**YEAR: 10 Pre ATAR Chemistry**

**TIME: 60 mins**

**QUESTIONS: Part A: Multiple Choice Questions (12 marks)**

**Part B: Short Answer Questions (25 marks)**

**Part C: Extended Answer Questions (6 marks)**

**TOTAL MARKS: (43 marks)**

|  |  |
| --- | --- |
| **MUST** Describe how atoms form an ionic bond Indicate the most likely number of electrons the atom will gain or lose when forming an ion. Describe what polyatomic ions areWrite the correct formula for ionic compoundsGive the correct name for ionic compounds given its formulaList properties of ionic compounds Identify the reactants & products in any chemical reactionConvert word equations into chemical equationsBalance a chemical equation when given an unbalanced chemical equation**.** Describe that increasing agitation, temperature, size of sample etc increase the rate of a reaction. | 1-8,14,15,17,19 |
| **COULD** Create balanced equations to predict the products of unfamiliar reactions. Apply the particle model to explain the factors influencing the rate of reactions in terms of collisions and bonding. **SHOULD** Create balanced equations to predict the products of unfamiliar reactions. Apply particle model to explain the factors influencing the rate of reactions in terms of collisions and bonding. | 9,10,11,16,17,19  12,18 |

**DO NOT WRITE ON OR MARK THIS PAPER**

Multiple Choice. Please answer on the sheet provided in the answer booklet.

1) What is the total number of atoms represented by the formula (NH4)3PO4?

A. 20  
B. 18  
C. 17  
D. 4

2) In one molecule of CaCO3, there will be:

A. 3 atoms of carbon.  
B. 1 atom of chlorine.  
C. 1 atom of calcium.   
D. 1 atom of oxygen.

3) The formula for sodium acetate is NaCH3COO. The valence of the acetate ion is:

A. +2  
B. –1  
C. –2   
D. +3

4) The formula of a chloride salt of ‘M’ is MCl2. What is the formula of a sulfate salt of ‘M’?

A. MSO4B. M2SO4C. M(SO4)D. It is not possible to get a sulfate salt of M

5) In potassium fluoride, the potassium atom donates an electron and the fluorine atom takes an electron. When the compound potassium fluoride is formed, which of the following are formed?

A. Covalent bonds.  
B. Ionic bonds .  
C. Metallic bonds  
D. Nuclear bonds.

6) Which of the following formula is **incorrect**?

A. K2NO3

B. AgCl

C. Na3PO4

D. Fe(CH3COO)3

7) Which product in the following chemical reaction is dissolved in solution?

CaCO3(s) + 2HCl(aq) → CaCl2(aq) + CO2(g) + H2O(l)

A. HCl

B. CaCl2

C. CO2

D. H2O

1. 8) The **unbalanced** formula equation that best represents the following word equation is?
2. iron(III) oxide + carbon monoxide → iron + carbon dioxide

A. Fe2O3 + CO → Fe + CO2

B. FeO + CO → Fe + CO2

C. Fe2O3 + CO2 → Fe + CO

D. FeO + CO2 → Fe + CO

9) Which of the following equations is balanced?

A. C2H6 + O2 → CO2 + H2O

B. C2H6 + O2 → 2CO2 + 3H2O

C. C2H6 + 7O2 → 2CO2 + 3H2O

D. 2C2H6 + 7O2 → 4CO2 + 6H2O

10) Which of the following chemical reactions is a combination reaction?

A. 2H2O(l) → 2H2(g) + O2(g)

B. 2H2(g) + O2(g) → 2H2O(l)

C. H2O2 → H2 + O2(g)

D. H2O + Na → NaOH + H2

11) What is the best term to describe the following reaction?

CaCO3(s) → CaO(s) + CO2(g)

A. combination reaction

B. metal displacement reaction

C. precipitation reaction

D. decomposition reaction

12) Explain why adding a catalyst to a reaction increases the rate of reaction.

A. The catalyst can provide a pathway for the chemical reaction that requires less energy.

B. The catalyst can help the reactant molecules to come together and react.

C. The catalyst can force reactants into the correct arrangement so that they react.

D. All answers are correct.



**Chemistry Pre ATAR 2019**

**ANSWER BOOKLET**

**NAME:**

**CLASS:** **DATE:**

Multiple Choice Short Answer Extended Response Total

**/6**

**/48**

**/29**

**/13**

|  |  |
| --- | --- |
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**SECTION ONE: Multiple choice answers**

**Cross (X) through the correct answer.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1** | **xxxx** | **b** | **c** | **d** |
| **2** | **a** | **b** | **xxxx** | **d** |
| **3** | **a** | **xxxx** | **c** | **d** |
| **4** | **xxxx** | **b** | **c** | **d** |
| **5** | **a** | **xxxx** | **c** | **d** |
| **6** | **xxxx** | **b** | **c** | **d** |
| **7** | **a** | **xxxx** | **c** | **d** |
| **8** | **xxx** | **b** | **c** | **d** |
| **9** | **a** | **b** | **c** | **xxxx** |
| **10** | **a** | **xxxx** | **c** | **d** |
| **11** | **a** | **b** | **c** | **xxxx** |
| **12** | **a** | **b** | **c** | **xxxx** |

**Short Answer**

14) Name each of the following (4 marks)

A. CaCO3 \_\_\_\_\_\_\_CALCIUM CARBONATE

B. Fe (OH)3\_\_\_\_\_\_\_\_IRON HYDROXIDE\_

C. LiF\_\_\_\_\_\_\_\_\_\_LITHIUM FLUORIDE

D. AlCl3\_\_\_\_\_\_\_\_ALUMINIUM CHLORIDE

15) Write down the chemical formulae for the following: (6 marks)

A. Calcium hydroxide \_\_\_\_\_\_\_\_\_\_\_Ca (OH)2

B. Ammonium carbonate\_\_\_\_\_\_\_\_\_\_(NH4)2CO3

C. Potassium phosphate\_\_\_\_\_\_\_\_\_\_\_K3PO4

D. Calcium chloride\_\_\_\_\_\_\_\_\_\_\_\_\_\_CaCl2

E. Aluminium nitrate \_\_\_\_\_\_\_\_\_\_\_\_\_Al(NO3)3

F. Calcium phosphate\_\_\_\_\_\_\_\_\_\_\_\_\_\_Ca3(PO4)2

16) Balance the following equations. (2 marks)

1. ZrO2 + 2C + Br2  ZrBr2 + 2CO
2. 2Al + 3Cl2  2AlCl3

17) Below are general equations showing reactions between chemicals. (10 marks)

*1) Acid + Metal hydroxide produces a salt + water.*

*2)* *Acid + metal oxide produces a salt and water*.

*3*) *Acid + Carbonate produces a salt + water + carbon dioxide*

*4) Acid and Hydrogen carbonate produces salt + water + carbon dioxide.*

*5) An acid and a metal produce a salt and hydrogen gas*

Write a **word equation** and then a **balanced equation** using formulae for the following using the above information.

(a) Magnesium and sulphuric acid

Word \_\_**magnesium + sulfuric acid→ magnesium sulfate + hydrogen gas. 1mark**

Balanced equation.\_\_\_\_\_**Mg + H2SO4 → MgSO4 + H2  1mark**

(b) Sulfuric acid and copper (ll) oxide

Word **sulfuric acid and copper (11) oxide produces copper sulfate and water**.  **1mark**

Balanced **HNO3 + NaOH → NaNO3 + H2O 1mark**

(c) Phosphoric acid and potassium hydroxide.

Word **phosphoric acid + potassium hydroxide → potassium phosphate and water 1mark**

Balanced equation.\_**H3PO4 +3 KOH → K3PO4 + 3H2O 1 mark eqn, 1 marked correctly balanced**

(d) ethanoic acid and potassium carbonate.

Word **ethanoic acid + potassium carbonate → potassium acetate + water + carbon dioxide 1mark**

Balanced equation 2**CH3COOH + K2CO3 → 2KCH3COO + H2O + CO2 1 mark eqn, 1 marked correctly balanced**

18) Below is solubility table.

|  |  |  |
| --- | --- | --- |
| Type of compound | Solubilty | Exceptions |
| Nitrates NO3- | Soluble | None |
| Chlorides Cl-  Bromides Br-  Iodide I- | Soluble | Ag+, Hg+, Pb+ |
| Sulfates SO4-2 | Soluble | Ca2+, Ba2+,Pb2+, Ag+ |
| Carbonates CO3-2 | Insoluble | Li+, Na+, K+, NH3+ |
| Phosphates PO4-3 | Insoluble | Li+, Na+, K+, NH3+ |

Using the table above, state if a precipitate would be formed when the following solutions are mixed. Name the precipitate.

(a) sodium chloride and lead (ll) nitrate → sodium nitrate + lead chloride. (3 marks)

**YES (0.5) Lead chloride**.(0.5)

(b) barium nitrate and potassium sulfate → barium sulfate + potassium nitrate

**YES Barium sulfate**

(c) lead (ll) nitrate and sodium iodide → sodium nitrate + lead iodide

**YES lead iodide.**

(d) Write a balanced equation for one of the reactions in which a precipitate was formed.

Any one of these:

2NaCl (aq) + Pb(NO3)2(aq) → PbCl2(s) + 2NaNO3(aq) 1 *mark for balanced equation*

Pb+2(aq) + 2Cl -1(aq) 🡪 PbCl2(s) *1 marks for balanced ionic equation*

*1 mark for states*

Ba(NO3)2(aq) + K2SO4 (aq) →BaSO4(s) + 2 KNO3(aq)

Ba+2(aq) + SO42-(aq) 🡪 BaSO4 (s)

Pb(NO3)2 (aq) +2 NaI (aq) → 2NaNO3 (aq) + PbI2 (s)

Pb+2(aq) + 2I -1(aq) 🡪 PbI2 (s)

**Extended Answer**

19) Reaction rates can be increased in a number of ways. Name two of them and explain why they increase the rate of the reaction. (6 marks)

Name (1)

Why they increase the rate of reaction (1)

Must go into detail about collision of particles (1)

Agitation

* Ensures reactants are kept in contact by removing build up
* Stirring ensures reactants keep colliding

Surface area

* Increased SA increases the contact between the reactants increasing the efficiency of the reactants
* More particles are reacting so reaction faster

Increase in Temp

* Increasing temp increases the speed of the particles which causes them to collide more frequently so more react in shorter time
* Increasing temp gives the particles more energy so when the molecules collide the chemical bonds are more likely to break and rearrange.

Catalyst

* Reduce amount of energy that is required to convert the reactants into products
* Make it easier for reactant molecules to collide and form products
* Enzymes- biological catalysts

Concentration

* Particles are more likely to collide and react because there is more of them
* More collisions means more breaking and rearranging of bonds