

C5 Revision Questions

Question 1 of 50

- What is a mole of a substance?

Answer 1 of 50

- A mole is 6.02×10^{23} (Avogadro's number) of particles of a substance, the same number of particles in 12g of Carbon-12.

Question 2 of 50

- How do you calculate molar mass?

Answer 2 of 50

- Molar mass is calculated by adding up all the relative atomic masses in the formula.

Question 3 of 50

- What is the relative atomic mass of an element?

Answer 3 of 50

- The relative atomic mass of an element is the average mass of the element compared to the mass of one atom of Carbon-12.

Question 4 of 50

- How do we calculate the number of moles of a substance (solid)?

Answer 4 of 50

- Number of moles (solid) = $\frac{\text{mass of chemical}}{\text{Molar mass}}$

Question 5 of 50

- What does conservation of mass mean?

Answer 5 of 50

- Conservation of mass means that in a chemical reaction, the mass of the atoms at the start equals the mass of the atoms at the finish.

Question 6 of 50

- What is the general word equation for the thermal decomposition of a metal carbonate?

Answer 6 of 50

- Metal carbonate \rightarrow metal oxide + carbon dioxide

Question 7 of 50

- What is empirical formula?

Answer 7 of 50

- Empirical formula is the simplest way of writing a whole-number ratio of each type of atom inside a molecule.

Question 8 of 50

- How is percentage mass calculated?

Answer 8 of 50

$$\% \text{ mass of element} = \frac{\text{total mass of the element in the compound} \times 100}{\text{Relative formula mass of the compound}}$$

Question 9 of 50

- What is the concentration of a solution?

Answer 9 of 50

- Concentration is the amount of solute (solid) in grams dissolved in 1dm^3 of solution.

Question 10 of 50

- What are the units of concentration?

Answer 10 of 50

- The units of concentration are mol/dm³ or g/dm³

Question 11 of 50

- What is volume measured in?

Answer 11 of 50

- Volume is measured in cm^3 or dm^3

Question 12 of 50

- How do you calculate the number of moles of a solution?

Answer 12 of 50

- Amount in moles (solution) = concentration x volume in dm^3
- OR
- Amount in moles (solution) = $\frac{\text{concentration} \times \text{volume in } \text{cm}^3}{1000}$

$$n = c \times v / 1000$$

Question 13 of 50

- How many cm^3 are in 1 dm^3 ?

Answer 13 of 50

- There are 1000 cm^3 in 1 dm^3

Question 14 of 50

- What is the general word equation for the reaction between acids and alkalis?

Answer 14 of 50

- Acid + alkali \rightarrow salt + water

Question 15 of 50

- What pH is an acid?

Answer 15 of 50

- Acids have a pH less than 7

Question 16 of 50

- What pH is a neutral solution?

Answer 16 of 50

- A neutral solution is pH 7

Question 17 of 50

- What pH is an alkali?

Answer 17 of 50

- Alkalis have a pH of more than pH7

Question 18 of 50

- What colour is litmus in alkali?

Answer 18 of 50

- Litmus is blue in alkali

Question 19 of 50

- What colour is litmus in acid?

Answer 19 of 50

- Litmus is red in acid.

Question 20 of 50

- What colour is phenolphthalein in alkali and in acid?

Answer 20 of 50

- Phenolphthalein is pink in alkali, colourless in acid

Question 21 of 50

- How do you calculate the number of moles of gas produced in a reaction?

Answer 21 of 50

- Number of moles of gas = $\frac{\text{volume of gas in dm}^3}{24}$

Question 22 of 50

- What is the limiting reactant in a chemical reaction?

Answer 22 of 50

- The reactant used up first is the limiting reactant.

Question 23 of 50

- On a graph, what shows the rate of reaction?

Answer 23 of 50

- The gradient of a graph shows the rate of the reaction.

Question 24 of 50

- What is the word and symbol equation for the reaction to form ammonia?

Answer 24 of 50

- Nitrogen + Hydrogen \rightleftharpoons ammonia
- $\text{N}_2(\text{g}) + 3\text{H}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$

Question 25 of 50

- What does this symbol mean \rightleftharpoons ?

Answer 25 of 50

- The \rightleftharpoons symbol means that a reaction is reversible.

Question 26 of 50

- When is a system in dynamic equilibrium?

Answer 26 of 50

- A chemical system is in dynamic equilibrium when:
 - Concentration of reactants and products remain the same
 - Rate of forward reaction = rate of reverse reaction
 - Closed system

Question 27 of 50

- What factors can affect the position of equilibrium composition?

Answer 27 of 50

Things that can affect the position of equilibrium:

- Concentrations of reactants or products
- Pressure in reactions involving gases
- Temperature

Question 28 of 50

- If the temperature of an exothermic reaction is increased, what happens to the position of equilibrium?

Answer 28 of 50

- If the temperature of an exothermic reaction is increased, the equilibrium moves to the left, making more reactants.

Question 29 of 50

- What is Le Chatelier's principle?

Answer 29 of 50

Le Chatelier's principle states:

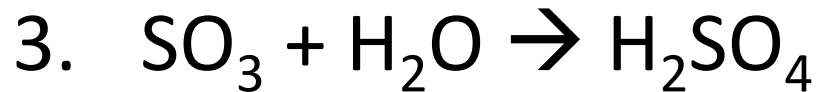
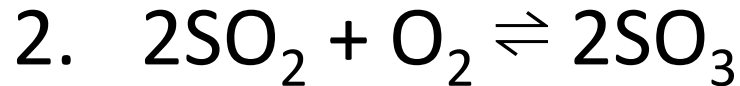
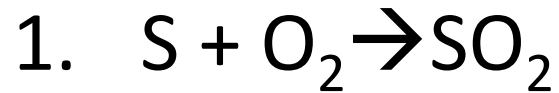
- When a system in dynamic equilibrium is subjected to change, the position of equilibrium will shift to minimise the change.

Question 30 of 50

- What are the symbol equations for the three stages of the contact process?

Answer 30 of 50

The three stages of the contact process:



Question 31 of 50

- What is the contact process?

Answer 31 of 50

- The Contact process is used to make sulfuric acid.

Question 32 of 50

- What is sulfuric acid used to make?

Answer 32 of 50

- Sulfuric acid is used to make fertilisers, paint, plastics and soap.

Question 33 of 50

- What are the three raw materials used for making sulfuric acid?

Answer 33 of 50

- The three raw materials for making sulfuric acid are sulfur, air and water

Question 34 of 50

- What conditions are required for the contact process?

Answer 34 of 50

The following conditions are used in the Contact process:

- V_2O_5 catalyst
- Temperature around 450°C
- atmospheric pressure.

Question 35 of 50

- Do catalysts alter the position of equilibrium?

Answer 35 of 50

- No, catalysts do not affect the position of equilibrium. They do make the reaction go faster, so equilibrium is achieved faster.

Question 36 of 50

- What ion is responsible for all reactions of acids?

Answer 36 of 50

- H^+ ions are responsible for all reactions with acids.
- Acids are **proton donors**.

Question 37 of 50

- What salts are made when sulfuric acid reacts with metal or metal compound?

Answer 37 of 50

- Sulfates are the salts produced when sulfuric acid reacts with a metal or metal compound.

Question 38 of 50

- What salts are formed when nitric acid reacts with a metal or metal compound?

Answer 38 of 50

- Nitrates are the salts produced when nitric acid reacts with a metal or metal compound.

Question 39 of 50

- What salts are formed when hydrochloric acid reacts with a metal or a metal compound?

Answer 39 of 50

- Chlorides are the salts formed when hydrochloric acid reacts with a metal or metal compound.

Question 40 of 50

- What happens when strong acids are added to water?

Answer 40 of 50

- The acid releases H^+ ions (protons) into solution when dissolved in water
 - E.g. Hydrochloric acid, HCl
 - $\text{HCl}(\text{g}) + \text{aq} \rightarrow \text{H}^+(\text{aq}) + \text{Cl}^-(\text{aq})$

Strong acids completely ionise in water.

Question 41 of 50

- What happens to weak acids when dissolved in water?

Answer 41 of 50

- When weak acids dissolve in water they only partially ionise.
- E.g.
- $\text{HA}(\text{aq}) \rightleftharpoons \text{H}^+(\text{aq}) + \text{A}^-(\text{aq})$
- E.g. Ethanoic acid
- $\text{CH}_3\text{COOH} \rightleftharpoons \text{H}^+ + \text{CH}_3\text{COO}^-$

Question 42 of 50

- What is the difference between a strong acid and a concentrated acid?

Answer 42 of 50

- The strength of an acid is a measure of the degree of ionisation of the acid. A strong acid completely ionises.
- The concentration of an acid tells us how many moles of acid there are in a dm^3 of solution. A concentrated acid has a high amount of moles of acid in a dm^3 of solution.

Question 43 of 50

- Is ethanoic acid or hydrochloric acid better at conducting electricity? Explain why.

Answer 43 of 50

- Hydrochloric acid would conduct electricity better than ethanoic acid. Ethanoic acid has a lower concentration of H^+ ions than the same concentration of hydrochloric acid. It is H^+ ions that carry the charge so ethanoic acid is less conductive.

Question 44 of 50

- What is the colour the precipitate formed when lead nitrate solution is added to the following halide ions?
- Cl^-
- Br^-
- I^-

Answer 44 of 50

- Cl^- = white precipitate
- Br^- = cream precipitate
- I^- = bright yellow precipitate

Question 45 of 50

- What ion is barium sulfate used to test for?
What is the positive result for this test?

Answer 45 of 50

- Barium chloride is used to test for sulfate ions.
- If sulfate ions are present, a white precipitate forms when barium chloride is added.

Question 46 of 50

- Why do the reactants need to be soluble in a precipitation reaction?

Answer 46 of 50

- In precipitation reactions, the reactants need to be able to move if they are to collide and react. This is why the reactants need to be soluble.

Question 47 of 50

What are the state symbols for the following:

- Solid
- Liquid
- Gas
- Aqueous (dissolved in water)

Answer 47 of 50

The state symbols for the following are:

- Solid (s)
- Liquid (l)
- Gas (g)
- Aqueous (dissolved in water) (aq)

Question 48 of 50

- What are the four stages in preparing an insoluble salt?

Answer 48 of 50

- To make an insoluble salt:
 1. Mix the solutions of the reactants
 2. Filter the precipitate
 3. Wash the precipitate with distilled water
 4. Dry the precipitate

Question 49 of 50

- What are spectator ions?

Answer 49 of 50

- Spectator ions do not directly take part in a reaction.

Question 50 of 50

- What does an ionic equation show?

Answer 50 of 50

- Ionic equations show only what is actually reacting, only the reacting ions are shown.