**Chemistry Revision: Volumes**

Mastery Matrix Points

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| Calculate the mass of solute in a given volume of solution |
| Explain how the mass of a solute and the volume of a solution is related to the concentration (HT only) |
| Calculate the moles of a solute in a given volume of solution (triple only) |
| Use titration results to calculate the concentration of a solution (triple only) |
| Explain how the concentration of a solution in Mol/dm3 is related to the mass and volume (triple only) |
| Explain how 1 mole of gas occupies the same volume for all elements (24dm3) at 20 °C and 1 atmosphere of pressure (triple only) |
| Calculate the volume of gas from its mass and relative formula mass (triple only) |
| Calculate the volumes of gaseous products and reactants from a balanced symbol equation (triple only) |
| Use and rearrange equations for calculating the volume of a gas (triple) |
| Using moles to balance equations |

Key Knowledge

Limiting reactant –

Reactant in excess –

Concentration –

At room temperature and pressure (20⁰C and 1atm), one mole of any gas takes up a volume of \_\_\_dm3.

Equations

moles = \_\_\_\_\_

Concentration (mol/dm3) =

Concentration (g/dm3) =

Volume of gas =

How to convert:

cm3 to dm3 -

dm3 to cm3 -

mol/dm3 to g/dm3 –

g/dm3 to mol/dm3 -

Steps of how to use moles to balance an equation:



**and Concentrations**

Understanding and Explaining

1. Calculate the concentration of a salt solution that contains 20g of salt in 400dm3 of water.
2. 2.00dm3 of sodium hydroxide solution contains 0.5 moles of sodium hydroxide. What is the concentration?
3. Calculate the volume of a 0.80 mol/dm3 potassium bromide solution containing 1.60 moles of potassium bromide.
4. Calculate the number of moles of hydrogen that occupy 6 dm3 at rtp (room temp and pressure).
5. 97g of hydrogen is produced. What volume of gas would this be at rtp?
6. 72g of argon is produced. What volume of gas is this at rtp?
7. Calculate the volume of oxygen that reactions with 96dm3 of hydrogen in this reaction:

2H2 +O2 🡪 2H2O

1. In a chemical reaction, 72g of magnesium was reacted with exactly 48g of oxygen molecules to produce 120g of magnesium oxide. Use the number of moles of reactants and products to write a balanced equation for the reaction.