



ACIDS, BASES & SALTS 2

1) a) What is an acid?

substance that releases H⁺ ions when added to water (1)

b) Nitric acid is a strong acid. Citric acid is a weak acid. What is the difference between strong and weak acids?

Acids break down into ions when added to water; in a strong acid, all the molecules break into ions; in a weak acid, only a small fraction of the molecules break into ions (3)

c) What is an alkali?

substance that releases OH⁻ ions when added to water (1)

2) Name the following substances and tick to show if they are acids, bases and/or alkalis. (6)

Formula	Name	Acid	Base	Alkali	Salt
NaOH	sodium hydroxide		✓	✓	
MgO	magnesium oxide		✓		
HNO ₃	sulfuric acid	✓			
NH ₃	ammonia		✓	✓	
KNO ₃	potassium nitrate				✓
Al ₂ (SO ₄) ₃	aluminium sulfate				✓

3) a) Complete the following equations.

i) copper oxide + hydrochloric acid → **copper chloride + water** (2)

ii) sulfuric acid + calcium hydroxide → **calcium sulfate + water** (2)

iii) ammonia + nitric acid → **ammonium nitrate** (2)

iv) nickel carbonate + sulfuric acid → **nickel sulfate + water + carbon dioxide** (2)

v) strontium + hydrochloric acid → **strontium chloride + hydrogen** (2)

b) Write the ionic equation for the reaction in (a) (ii). **H⁺ + OH⁻ → H₂O** (2)

c) i) Which of the reactions in (a) are redox (electron transfer) reactions? **v**

ii) Which of the reactions in (a) are acid-base (proton transfer) reactions? **i, ii, iii, iv** (2)

4) a) Give a balanced equation for: potassium hydroxide + sulfuric acid → potassium sulfate + water

2KOH + H₂SO₄ → K₂SO₄ + 2H₂O (2)

b) Give a balanced equation for: zinc(II) carbonate + nitric acid → zinc(II) nitrate + water + carbon dioxide

ZnCO₃ + 2HNO₃ → Zn(NO₃)₂ + H₂O + CO₂ (2)

Area	Strength	To develop	Area	Strength	To develop	Area	Strength	To develop
Done with care and thoroughness			Identify acids, bases, salts, alkalis			Write formulae		
Good SPG			Write word equations for acid reactions			Write balanced equations		
Can define acids and alkalis			Electron v proton transfer			Write ionic equations		
Understand strong and weak acids								