Worksheet 1.1: Acids, Bases and Salts

ChemistrySheets

Specification: GCSE Chemistry (AQA 5.4.2 / Edexcel SC10 / OCR Gateway C4.1)

Core Concepts: Define acid, base, alkali, salt. Understand the pH scale and indicators. Describe neutralisation reactions and the reactions of acids with metals, metal oxides, metal hydroxides, and metal carbonates. Explain how to prepare soluble salts.

Section A: Key Terms & Definitions

1. Match the following key terms to their correct definitions.

a) **Acid**

b) **Base**

c) **Alkali**

d) **Salt**

e) **Neutralisation**

Definitions:

- **P:** A substance that produces hydroxide ions (OH^-) when dissolved in water.
- **Q:** A compound formed when the hydrogen ion of an acid is replaced by a metal ion or ammonium ion.
- **R:** A reaction between an acid and a base, forming a salt and water.
- **S:** A substance that produces hydrogen ions (H^+) when dissolved in water.
- **T:** A substance that neutralises an acid. It can be a metal oxide, metal hydroxide, or metal carbonate.

a) Acid: _____

b) Base: _____

c) Alkali: _____

d) Salt: _____

e) Neutralisation: _____

2. Complete the following sentences using appropriate chemical terms.

a) An acid is a substance that produces _____ when dissolved in water.

b) An alkali is a soluble _____ that produces _____ when dissolved in water.

c) The reaction between an acid and a base is called _____, which typically forms a _____ and _____.

d) The pH scale ranges from _____ to _____. A solution with a pH of _____ is considered neutral.

Section B: Core Concepts & Explanations

1. Answer the following questions.

a) Define an acid and an alkali in terms of the ions they produce in aqueous solution.

b) Describe how the pH scale is used to indicate the strength of an acid or alkali.

c) Explain what happens at the ionic level during a neutralisation reaction between an acid and an alkali.

d) Describe the general reaction of an acid with a metal carbonate, including any observable changes.

Section C: Exam Application & Extended Writing

1. The diagram below illustrates a method for preparing a soluble salt from an acid and an insoluble base.

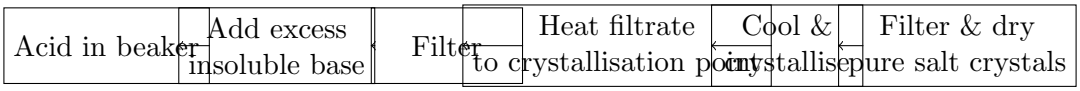

Figure 1: Preparation of a soluble salt from an acid and an insoluble base.

a) Explain the purpose of each of the following steps in the preparation of the pure, dry salt:

i) Adding excess insoluble base.

ii) Filtering the mixture after adding the base.

b) Describe in detail how you would prepare a pure, dry sample of copper sulfate from dilute sulfuric acid and copper(II) oxide. Include all necessary steps and observations. (6 marks)