

Lab: Properties of Acids and Bases

Different substances may be distinguished from each other by the differences in their properties. When a number of different compounds have several common properties they are often classified for convenience as a distinct type of compound. Two important types of compounds are the acids and the bases. All acids have common properties and all bases have common properties.

The observable properties which describe the experimental behaviour of acids or bases constitute an operational definition of an acid or base. By studying the formulas, atomic and molecular structures, and reactions of substances which qualify as acids or bases under our operational definition, we can develop conceptual definitions for them. Conceptual definitions help to explain why certain substances behave in a common manner. These definitions will help you to classify a substance as an acid or base.

In this lab you will be provided with **6 solutions**, (all 0.10 mol dm^{-3}), 3 of which are acids and the other 3 are bases. Some of these 6 solutions will be strong acids or bases, whilst some may be weak acids or bases.

Your task is to correctly label the 6 unknown solutions as either acids or bases, based on the properties common to most acids and common to most bases. Further to classify these 6 solutions as either strong or weak acids. It is advisable to perform as many experiments as possible in order to classify these solutions correctly.

Choose the apparatus and materials required by you and let your teacher know in advance of all the chemicals required by you, assume that the laboratory is equipped with the necessary apparatus. Choose a method of controlling the variables and testing the results in each of your experiments, taking into account of all safety features. Make a suitable data table for all your data collection.