

Research Methodology in Chemistry

Edited by
Fiona N.-F. How, Ph.D



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RESEARCH METHODOLOGY IN CHEMISTRY

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CHAPTER – 4

SEPARATION AND PURIFICATION METHODS

Shafida Binti Abd Hamid

Purification of compounds is very important in synthesis to get rid of any unreacted starting materials, intermediates or by-products. There are several methods that are used to purify the products in organic synthesis. This chapter will cover a few commonly used techniques to obtain high purity of products from chemical synthesis.

Solvent Extraction

Solvent extraction is normally the first step used by chemists to separate the product from other impurities. This technique, commonly called 'work up' is usually employed after the reaction is completed. The method involves extraction of substance from suspension or solution into another solvent using separatory funnel. For example, if we want to separate our organic products from inorganic impurities, it can be done by shaking an aqueous solution or suspension with suitable organic solvents such as tetrahydrofuran, hexane, chloroform, dichloromethane, diethyl ether, ethyl acetate or petroleum ether. The organic phase is then separated from the aqueous phases. After a few extractions, the organic phase is combined, dried using a drying agent, such as magnesium sulfate (MgSO_4), calcium sulfate (CaSO_4), sodium sulfate (Na_2SO_4) or calcium chloride (CaCl_2) before the solvent is evaporated. The product obtained usually needs to be further purified. The flow of extraction is summarised in Figure 4.1.