Research Methodology in Chemistry

Edited by Fiona N.-F. How, Ph.D
RESEARCH METHODOLOGY IN CHEMISTRY

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CHAPTER – 3

POLYMER ANALYSIS AND CHARACTERIZATION

Rosliza Binti Mohd. Salim

The characterization of polymeric materials naturally divides into consideration of the isolated polymer molecule and the structures that are created once these species are allowed to aggregate. The physical and chemical properties of polymeric materials influence their processing and use, so their polymerization and processing have to be carefully controlled.

High Performance Liquid Chromatography (HPLC)

High performance liquid chromatography (HPLC) is a powerful tool to characterize synthetic and natural polymers by separating individual fractions accordance to molecular weight, chemical composition, functional groups, etc. It is also used for isolation and purification if biopolymers and analysis of additives in complex polymer formulations. As in any chromatographic technique, separation occurs due to thermodynamic partitioning between the sample components in the mobile and stationary phases. In HPLC, this process takes place in solution inside a chromatographic columns packed with inorganic (usually silica based) or organic porous particles, capable of resisting the high pressure created by a moving liquid (mobile phase) mechanically pumped through the column. Depending on the application, isocratic (constant mobile phase composition) or gradient (variable composition) modes of separation can be employed, which significantly extends the capabilities of the techniques (Wiley, 2008; Pethrick and Viney, 2003).