Fractionation and Chromatographic Methods in Biochemical Analysis

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1.1 General Overview of Mixtures and Solutions

1.1.1 Introduction to Mixtures

Matter in the real world seldom exists as a perfectly pure substance. More commonly, it appears as an admixture—two or more distinct chemical species sharing the same physical space without undergoing chemical transformation. This chapter lays the foundation for understanding the classification, properties, and behavior of such mixtures, with particular emphasis on solutions, a critically important class of homogeneous mixtures in chemistry and biochemistry.

A mixture is a physical combination of two or more substances in which each component retains its chemical identity and properties. Mixtures are categorized by the uniformity of their composition:

- **Homogeneous mixtures** exhibit a uniform composition and appearance throughout. At the molecular level, the components are distributed so evenly that any sample taken from the mixture has the same ratio of constituents. Examples include atmospheric air (a blend of N_2, O_2, Ar, and trace gases) and metal alloys such as bronze (Cu-Sn).