
Title: Synthesis and Separation of Proteins and Enzymes



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Proposal

Proteins are considered as high-value products with functional, nutritional and medical properties. The major sources of proteins are of animal (bovine, camel, goat etc.) and plant origin. They can also be produced synthetically by using enzymatic processes. Proteins are unique macromolecules and can be used as an integral part in the formulation of foods that provide health benefits to the growing population. Various processes including chromatographic separations, membrane-based processes, adsorption methods, centrifugation and their combinations have been examined in the laboratory-scale separation of proteins. All of them have advantages, disadvantages and special features that suit their application in specific separation problem. A few of these methods are being evaluated for industrial development because they are economic, efficient, environmentally-friendly and can be implemented in large-scale modules. Also the prices of some devices, especially adsorptive and membrane separation devices, have been decreasing in addition to the development of new high-flux, low-fouling membrane materials and use of green solvents in separation methods.

Enzymes are proteins with catalytic ability to convert a less useful compound to a more useful product at a fast rate. For example, proteolytic enzymes (proteases and proteinases) are capable of hydrolysis. They exist in all living organisms and can be classified as: microbial, plant, animal and humane origin. They possess great medical and pharmaceutical properties and extensively used in industrial processes (bakery, brewing and tannery) and biotechnology. They can be produced using separation/extraction processes similar to those of proteins, i.e. extraction from the source, filtration (including membrane separation), centrifugation, precipitation, adsorption/ion exchange, solvent extraction and final purification.

As a result, there have been steady and considerable progress in the application of separation science and technology in large-scale processing of proteins and enzymes either from natural or synthetic sources. This special issue will include updated information on the synthesis and separation methods.
