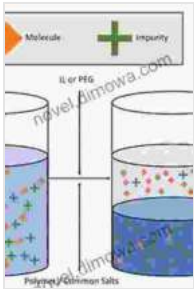


Aqueous Two Phase Systems for Bioprocess Development and the Recovery of Bioproducts



Aqueous Two-Phase Systems for Bioprocess Development for the Recovery of Biological Products (Food Engineering Series) by Yoel Rak

★★★★★ 5 out of 5

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Enhanced typesetting : Enabled
Print length : 200 pages



In today's fast-paced and competitive biopharmaceutical industry, the efficient and cost-effective recovery of high-value biomolecules is paramount. Aqueous Two Phase Systems (ATPS) have emerged as a game-changer in this field, offering a unique and powerful approach to bioprocess development and product purification.

This comprehensive article will delve into the principles, advantages, and applications of ATPS in bioprocessing. We will explore how these innovative systems can help you optimize your processes, reduce costs, and achieve higher yields of purified bioproducts.

What are Aqueous Two Phase Systems?

ATPS are a class of biphasic systems comprised of two immiscible aqueous solutions. Typically, one phase is rich in a hydrophilic polymer, while the other is rich in a salt or other kosmotropic agent. When these two solutions are mixed, they spontaneously separate into two distinct phases with different physicochemical properties.

The formation of ATPS is driven by a combination of factors, including hydrophobic interactions, hydrogen bonding, and electrostatic forces. The relative concentrations of the two phases and their components determine the partition coefficient of biomolecules between the phases.

Advantages of ATPS in Bioprocessing

ATPS offer several unique advantages over traditional bioprocessing techniques, including:

- **Mild and Biocompatible:** ATPS are operated under gentle conditions that preserve the biological activity and integrity of biomolecules.
- **Selective Partitioning:** The partitioning of biomolecules between the two phases can be finely tuned by adjusting the composition and properties of the ATPS.
- **Scalability:** ATPS can be easily scaled up from laboratory to industrial scale, making them suitable for large-scale bioproduction.
- **Cost-Effective:** ATPS components are relatively inexpensive, and the process can be operated with low energy consumption.

Applications of ATPS in Bioprocess Development

ATPS have a wide range of applications in bioprocess development and product recovery, including:

- **Cell and Protein Harvesting:** ATPS can be used to gently harvest cells from culture and separate them from unwanted components.
- **Product Purification:** ATPS can selectively partition target biomolecules, such as proteins, antibodies, and enzymes, away from impurities and contaminants.
- **Product Concentration:** ATPS can be used to concentrate target biomolecules by partitioning them into a smaller volume of the desired phase.
- **Biocatalysis:** ATPS can be used to create reaction compartments for biocatalysis, enabling efficient and selective enzymatic reactions.

Case Studies and Success Stories

Numerous case studies and success stories demonstrate the effectiveness of ATPS in bioprocess development and product recovery. For example, ATPS have been successfully used to:

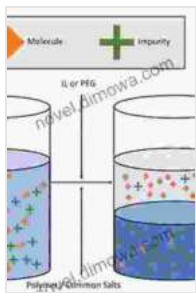
- Develop a scalable process for the production of a monoclonal antibody.
- Improve the purity and yield of a recombinant enzyme.
- Recover a bioactive peptide from a complex fermentation broth.

Aqueous Two Phase Systems represent a transformative technology for bioprocess development and the recovery of high-value biomolecules. Their unique properties, advantages, and broad range of applications make them an essential tool for researchers and manufacturers in the biopharmaceutical industry.

By leveraging the power of ATPS, bioprocess engineers can optimize their processes, reduce costs, and achieve higher yields of purified bioproducts. This can lead to significant breakthroughs in drug development, vaccine production, and the production of other valuable biologics.

Call to Action

Unlock the potential of Aqueous Two Phase Systems in your bioprocess development. Contact us today to learn how ATPS can help you achieve your research and manufacturing goals.



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