Partitioning of crude protein from aqua waste using PEG 600-Inorganic salt aqueous two-phase systems

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Title: Partitioning of crude protein from aqua waste using PEG 600-Inorganic salt aqueous two-phase systems

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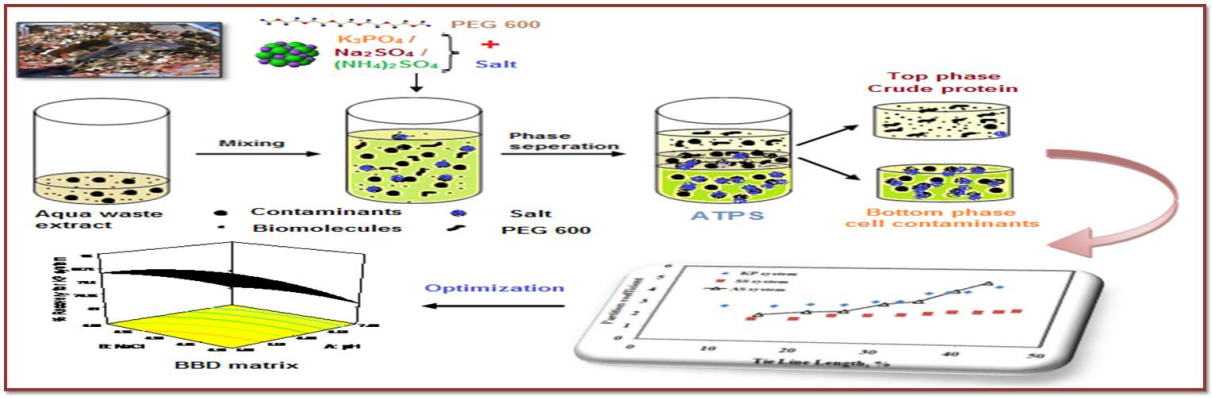
Abstract

An acceptable polymer-inorganic salt Aqueous Two-Phase System (ATPS) has been discovered for the crude protein partitioning from aqua waste. This study determines the effect of type of salt, temperature, pH and neutral salt (NaCl) concentration on percentage recovery of protein in ATPSs which are composed of polyethylene glycol (PEG) 600 and three inorganic salts. In all systems, crude protein has displayed an affinity for the PEG-rich phase. The partition coefficient was found to be increased with increasing both PEG 600- inorganic salt concentrations. The higher value of tie-line length could maximize the percentage recovery of protein from aqua waste. This was mainly owing to the excluded volume effect and salting out effect in ATPS. PEG 600-Ammonium Sulphate system was found to be the most favorable system among the three ATPS which showed the maximum yield of crude protein that was 99.4% obtained at pH 5, sodium chloride concentration 0.3M and temperature 20°C.

Graphical abstract



Keywords

Aqueous Two-Phase System; Aqua waste; Protein recovery; Partitioning; Response surface methodology