

Optimization of thaumatin extraction by aqueous two-phase system (ATPS) using response surface methodology (RSM)

The work attempts to study and optimize aqueous two-phase system (ATPS) made of polyethylene glycol (PEG)/sodium sulfate and PEG/potassium phosphate. Five factors (PEG's molecular weight, PEG's concentration, pH, concentration of sodium chloride and phase-forming salt) affecting the thaumatin partitioning were studied. A two-level fractional factorial was initially carried out. The statistical analysis showed that for both the systems, the phase-forming salt concentration and the concentration of sodium chloride significantly affects the K value for thaumatin partitioning. However, the performance of PEG/sodium sulfate system was generally better than the PEG/potassium phosphate system. Hence a detail study was carried out on the PEG/sodium sulfate system using central composite rotatable design (CCRD) in response surface methodology (RSM). It was observed that high salt concentration increased the K value by sevenfold and the PEG molecular weight was not a significant factor. The optimal condition gave a K value for thaumatin partitioning of 24.15 with a yield of 96.02%.