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Aqueous Two Phase Extraction of Jonesia denitrificans Xylanase 6 in PEG 1000/Phosphate System

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Abstract : The impetus for research in the field of bioseparation has been sparked by the difficulty and complexity in the downstream processing of biological products. Indeed, 50% to 90% of the production cost for a typical biological product resides in the purification strategy. There is a need for efficient and economical large scale bioseparation techniques which will achieve high purity and high recovery while maintaining the biological activity of the molecule. One such purification technique which meets these criteria involves the partitioning of biomolecules between two immiscible phases in an aqueous system (ATPS). The Production of xylanases is carried out in 500ml of a liquid medium based on birchwood xylan. In each ATPS, PEG 1000 is added to a mixture consisting of dipotassium phosphate, sodium chloride and the culture medium inoculated with the strain Jonesia denitrificans, the mixture was adjusted to different pH. The concentration of PEG 1000 was varied: 8 to 16 % and the NaCl percentages are also varied from 2 to 4% while maintaining the other parameters constant. The results showed that the best ATPS for purification of xylanases is composed of PEG 1000 at 8.33%, 13.14 % of K2HPO4, 1.62% NaCl at pH 7. We obtained a yield of 96.62 %, a partition coefficient of 86.66 and a purification factor of 2.9. The zymogram showed that the activity is mainly detected in the top phase.

Keywords : Jonesia denitrificans BN13, xylanase, aqueous two phases system, zymogram
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