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Indigo Production in a Fed Batch Bioreactor Using Aqueous-Solvent Two Phase System

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Abstract : Today dye stuff sector is one of the major chemical industries in India. Indigo is a blue coloured dye used all over the world in large quantity. The indigo dye produced and used in textile industries is synthetic having toxic effect, thus there is an increase in interest for natural dyes owing to the environmental concerns. The present study focuses on the use of a strain Pandoraea sp. isolated from garage soil, for the production of indigo in fed batch bioreactor. A comparative study between single phase and two phase production was carried out in this work. The blue colour produced during the experiments was analyzed using, TLC, UV-visible spectrophotometer and FTIR technique. The blue pigment was found to be indigo. The production of bio-indigo was done in a single phase fermentor carrying medium and substrate indole in dissolved form and was found to produce maximum of 0.041 g/L of indigo. Whereas there was an increase in production of indigo to 0.068 g/L in a two phase, water-silicone oil system. In this study the advantage of using second phase as silicone oil has enhanced the indigo production, as the second phase made the substrate available to the bacteria by increasing the surface area as well as it helped to prevent the inhibition effect of the high concentration of substrate, indole. The effect of single and two phases on the growth of bacteria was also studied.

Keywords : dyes, fed batch reactor, indole, Indigo
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