

Immobilization of phenol degrader pseudomonas sp in repeated batch culture using bioceramic and sponge as support materials

Abstract

The performance of two types of inert support, namely bioceramic and sponge to immobilize a locally isolated phenol degrader *Pseudomonas* sp. in a packed column was investigated in repeated batch culture. Prior to this, our study indicated that immobilization had doubled the tolerance limit of the cells towards phenol from 1000 ppm (in the suspended culture), to 2000 ppm. For the same volume, the bioceramic managed to trap bacterial cells 1.8 times greater than the sponge did. As a result, it was able to remove 100% of 1000 ppm 600-ml phenol fed at a rate of 2.5 ml/min within 24 hours, and the phenol removal capacity was sustained in the next six consecutive batches. Cells entrapped in sponge however, managed to remove around 90% phenol in five batches. Despite lower performance, at large scales, the use of sponge for cell entrapment offers some merits such as lightness, and easily available at cheaper cost.