

Biodegradation of phenol using *Sphingomonas sp.* GY2B immobilized in PVA –sodium alginate –kaolin

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Batch Experiments

To further confirm the biodegradation of phenol using bacteria immobilized in PVA–sodium alginate–kaolin, the removal of phenol when time was investigated. As shown in Figure 1, phenol was removed more quickly from aqueous solution using GY2B immobilized in beads.

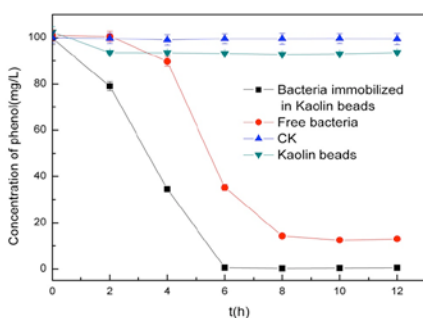


Figure 1: Biodegradation of phenol by free bacteria and kaolin beads ; initial phenol concentration = 100 mg/L.

Results and Discussion

Results indicated that the rate of removal of phenol from solution using GY2B immobilized in PVA-sodium alginate-kaolin was much higher than that of free cells. This can be explained by the fact that phenol was adsorbed onto the beads and further degraded by the cells on immobilized beads[1]. High biodegradation of phenol utilizing immobilized cells resulted from the alteration of cell permeability, allowing a better transfer of phenol into each cell[2]. In addition, the structure of the kaolin could be enough to maintain the biological activity of the entrapped cells[3].

[1] Kulkarni *et al.* (2007), *J. Environ. Manage.* **85**, 496-512. [2] Manohar *et al.* (2001), *Appl. Microbial. Biot.* **55**, 311-316.

[3] Coradin *et al.* (2003), *Appl. Microbial. Biot.* **61**, 429-434.