

## **Stability improvement of algal-alginate beads by zeolite molecular sieves 13X**

### **ABSTRACT**

This research aimed to improve the stability of Chlorella-Alginate Beads (CABs) by zeolite molecular sieves 13X. Dissolution time of synthesized Zeolite-Algal-Alginate Beads (ZABs) in a chelating agent revealed a significant improvement on the beads stability ( $78.5 \pm 0.5$  min) compared to the control beads ( $51.5 \pm 0.5$  min) under the optimum conditions of zeolite/alginate (1.5:1), pH 5 and 2% of beads. Monitoring cell growth during 5 days of incubation showed good biocompatibility of zeolite 13X. Scanning electron microscopy (SEM) indicated rough surface and spherical shapes of ZABs. Energy dispersive X-ray spectroscopy (EDX) and Fourier transform infrared spectroscopy (FTIR) of ZABs confirmed the presence of zeolite 13X within the matrix. The zeta potential value of ZABs indicated that the beads were relatively stable. The findings of this research showed that zeolite molecular sieves 13X have the potential to improve the stability of algal-alginate beads compared to common beads.

**Keyword:** Chlorella-Alginate Beads; Stability; Zeolite molecular sieves 13X