

High Cell Density Culture System using Flocculent Yeast in an Internal Cell Recycle Bioreactor

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An internal cell recycle bioreactor was proposed for high concentration of flocculent yeast. The cell recycle unit was composed with an up-flow packed bed and sedimentation system. Flocculent yeast (*Saccharomyces uvarum* strain) was used to obtain the sedimentation effect and activated carbon (700–1000 μm) was selected as a packing material, which was utilized to retain cells not separated by sedimentation step. A 1.3 cm (ID) \times 30 cm long quartz column was used in the 2.5 L bioreactor. In the bottom side of column, a fabric material was set up to recycle cells roughly. Continuous ethanol fermentation was carried out to obtain a high cell density as well as a high productivity. Bleeding ratio was varied between 15.5 and 58 % at dilution rate of 0.18 – 1.00 /h.