Effect of Environmental Factors on Flocculating Activity of a Bioflocculant Produced by Bacillus sp. DYU1

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ABSTRACT

Bioflocculants are being paid more attention because they were nature high elements flocculants and have the proprieties of indocility, safe, high effect, biodegradation,without second polluting,etc. They have been widely used in wastewater treatment, food and fermentation industries, and tap water producing. DYU 300, a bioflocculant which produced from Bacillus sp. DYU1 was the fermentation liquid with cells. It had a good flocculating capability and its flocculating activity in kaolin suspensions were investigated. The component of DYU 300 was contained total sugars (13.5%), uronic acids (3.4%), proteins (4.7%) and polyamides (48.7%). Fourier transform infrared spectrum (FT-IR) analysis showed the presence of carboxyl and amino groups in the bioflocculant. It can be seen that flocculating activity, flocculating rate, viscosity of the culture broth increase with growth of Bacillus sp. DYU1, indicating that the bioflocculant is produced from the bacterium during its growth period. Addition metal ions Ca2+ or Mg2+ to the kaolin suspension can promote the flocculating activity of DYU 300, and its synergistic effects of metal ions were most effective at pH 6-8. At room temperature, add 40 mg-DYU 300/L and 41.5 mM MgSO4 to the suspension (pH 8), it can obtained highest flocculating activity and flocculating rate were 19.5 and 97.4%, respectively.

Keywords : flocculantion, bioflocculant, kaolin, biopolymer

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