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DEMULSIFICATION OF WATER-IN-OIL EMULSIONS BY A DEMULSIFYING *Alcaligenes* sp. STRAIN GROWTH ON N-ALKANE

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Abstract

Environment-friendly demulsifying strains could be applied in breakup of emulsion produced in the petroleum industry. The demulsifying strain *Alcaligenes* sp. S-XJ-1 was found to be capable of utilizing paraffin or certain pure n-alkane as its sole carbon source, and exhibited a strong cell surface hydrophobicity above 70% and demulsifying ability above 80%. A maximum biomass of 6.27 g/L was obtained when the demulsifying strain was cultured using eicosane as carbon source. A positive correlation appeared to exist between the resulting biomass and alkane carbon chain length, indicating that waste mineral oils rich in long chain alkane could be potential substrates for producing biodemulsifiers. The highest emulsion breaking ratio of 96% was obtained when the demulsifying strain was cultured using hexadecane as carbon source. Its biological demulsification process was analyzed by using Turbiscan Lab[®] Expert as following: began with the flocculation and coalescence of dispersed droplets, followed by the settling of dispersed droplets, which finally induced separation of the oil and water phases. The critical point of phase separation in the emulsion by the strain produced using hexadecane appeared in the first hour of the demulsification process, which exhibited faster emulsion-breaking speed than that produced by paraffin.

Key words: alkane, demulsification process, demulsifying strain, waste mineral oils, water-in-oil emulsion

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