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HYDROLASE ACTIVITY DURING MICROAEROBIC THERMOPHILIC DIGESTION OF SLUDGE AFFECTED BY SODIUM DODECYLBENZENE SULFONATE (SDBS)

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Abstract

In the presence of surfactant sodium dodecylbenzene sulfonate (SDBS), the development of main hydrolysis products (soluble carbohydrate and protein) and hydrolytic enzyme activities (amylase and protease) were monitored during microaerobic thermophilic digestion (MATD) of waste activated sludge (WAS). Results showed that the presence of SDBS remarkably increased the solubility of protein and carbohydrate into aqueous phase. The maximal concentration of carbohydrate and protein was 990.39 and 2832.67 mg/L at SDBS dosage of 0.02 g/g dry sludge (DS), while it was only 513.92 and 1791.37 mg/L in the blank test (without SDBS). But the activities of amylase and protease were improved only at lower SDBS dosage (0.02 g/g DS), the maximum of whose showed a 1.23-fold and 1.20-fold as those of the blank test, respectively. The maximum activity of enzymes decreased with the SDBS dosages increasing to 0.1-0.2 g/g DS. The effect of pH on the hydrolytic enzyme activities was studied at 4.0, 6.0, 7.0, 8.0 and 10.0, respectively. Results revealed that the higher enzyme activities were produced at the neutral condition (pH 7.0), which suggested a predominance of neutrophilic populations during MATD.

Key words: amylase, MATD, protease, SDBS, WAS

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