Characteristics of Granular Sludge of the Internal Circulation Anaerobic Expanded Bed Reactor

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Abstract: Granular sludge characteristics of the Internal Circulation Anaerobic Expanded Bed (ICAEB) reactor is reported. Experimental results show that the mean COD removal was 89.0% and the internal circulation flow rate was about 12.5 when the reactor running steadily with the mean COD volumetric loading rate 28.2 kg/(m³·d). General granular sludge and suspended granular sludge are cultured in the reactor. The suspended granular sludge layer found in the fluid level of the second reaction section is dynamically stable. Keeping comparative steady operational condition could reduce the adverse influence of the suspended granular sludge layer, if necessary, suitable measurement could be adopted to remove the overabundant suspended granular sludge off.

Key words: internal circulation anaerobic expanded bed reactor; internal circulation; granular sludge; suspended granular sludge

1 ICAEB (the internal circulation anaerobic expanded bed reactor, ICAEB reactor)

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IC (the internal circulation anaerobic expanded bed reactor, ICAEB reactor)
3 ICAEB

3.1 ICAEB

ICAEB 143 d 3 1 – 56 57 – 113 114 – 143 2 2.

COD/5 0.6 – 1.0 m3/d 1.08.

COD 23.2 – 53.7 m3/h.

COD 800 mL/(g* d)
3.2.2 Appearance of granular sludge

Fig. 3 Appearance of granular sludge

Fig. 2 Time course of influent COD concentration, COD volumetric loading rate, effluent COD concentration and COD removal

COD 400 mL/(g·d)
3.2.3 Microorganism photograph of general granular sludge

Fig. 4 Microorganism photograph of general granular sludge

Fig. 5 Microorganism photograph of suspended granular sludge

0.4% - 6.7%

(2) 800 mL/( g* d) .

(3) 0.8–1.4 mm [16] 2 [17] 400 mL/( g* d) .

(4) (POPs)