พิมพ์ต้นฉบับบทคัดย่อวิทยานิพนธ์ภายในกรอบสีเขียวนี้เพียงแผ่นเดียว

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KEY WORD: COAGULANT / PELLET / TURBIDITY
KANTAPAN PISALSUKSKUL : PRACTICALITY OF THE PELLET RECIRCULATION FOR THE REDUCTION OF CHEMICALS DOSAGE REQUIREMENT IN AN UPFLOW PELLETIZATION PROCESS.
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In this study, a portion of discharged pellet form the top part of the pellet blanket was internally recirculated back to the bottom section of the pelletizer, to be mixed with the already destabilized incoming river water before again fed upward into the reacton. Alum was used as coagulant at the appropriate doses whereas a nonionic polymer of the concentration of 0.1 to 0.3 mg/l was used as coagulant aid. The recirculation rate(Qr) was set at 0 to 0.4 of the incoming flow. The reactor was run continuously for at least 72 hours in order to reach the steady state as much as possible. The feed (taken from the Chao Phraya river which had the turbidity varying from 20 to 400 NTU at different seasons of the year), the treated water and the pellets (at different heights between 40-130 cm.) were collected for analysis. Turbidity, colloidal charge, alkalinity, pH, suspended solids concentration and size and settling velocities of the pellets were routinely monitored.

Conclusion

1. The upflow pelletization process could produce the high quality water (less than 5 NTU) with less alum dose when pellet recirculation was introduced. For the raw water which had low turbidity (20-100 NTU), the alum dose was not necessery. When the raw water had the high turbidity (100-250 NTU), the alum dose was 15.12 mg/l whereas a nonionic polymer was 0.1 mg/l.

2. As the recirculation rate increased, denser and faster-settling pellets were reported. For the raw water which had the low turbidity, the pellet density and the pellet settling velocity at 130 cm height was 1.39 g/cm^3 and 36.44 cm/min, respectively, when a nonionic polymer of 0.3 mg/l was used as coagulant and Qr was 0.4 of incoming flow.

3. The pellet retention time(PRT) was about 2.5-3.5 days when the raw water had the low turbidity and was about 1.5-2.5 days when the raw water was highly turbid. Besides, PRT was lower when Qr was higher.

4. When the recirculation rate was 0.2 of the incoming flow, the starting time was shorter. For the raw water which was highly turbid, when a nonionic polymer dose was 0.3 mg/l and the alum dose was 15.12 mg/l, the upflow pelletization process could produce the high quality water at even the start of run.

5. As Qr increased, higher removal efficiency per pellet mass was reported. The removal percentage per pellet mass was 1.06% Tr/g when the recirculation rate was 0.4 of the incoming flow, but was only 0.82% Tr/g when the recirculation rate was not used.

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