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Treatment of swine wastewater using chemically modified zeolite and bioflocculant from activated sludge

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Abstract:

Sterilization, alkaline-thermal and acid-thermal treatments were applied to activated sludge and the pre-treated sludge was used as raw material for *Rhodococcus* R3 to produce polymeric substances. After 60 h of fermentation, bioflocculant of 2.7 and 4.2 $g \cdot L^{-1}$ were produced in sterilized and alkaline-thermal treated sludge as compared to that of 0.9 $g \cdot L^{-1}$ in acid-thermal treated sludge. Response surface methodology (RSM) was employed to optimize the treatment process of swine wastewater using the composite of bioflocculant and zeolite modified by calcining with MgO. The optimal flocculating conditions were bioflocculant of 24 $mg \cdot L^{-1}$, modified zeolite of 12 $g \cdot L^{-1}$, $CaCl_2$ of 16 $mg \cdot L^{-1}$, pH of 8.3 and contact time of 55 min, and the corresponding removal rates of COD, ammonium and turbidity were 87.9%,