

Passivating Effect of Montmorillonite on Heavy Metals during Sewage Sludge Composting

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Abstract: Heavy metal pollution in municipal sewage sludge is main factor limiting their resource utilization and the migration of heavy metals directly determines the biological safety of the composting products. This experiment studies the effect of the montmorillonite on the heavy metal passivation and maturity during the sewage sludge composting using mushroom residue and pig manure as regulator. Results indicate that the content of exchangeable Cu and Pb increase and their mobility enhanced for the composting without passivation agent. However, for the composting with montmorillonite as passivation agent, the effectiveness of the heavy metal is inhibited and the best passivating effect could be achieved when the amount of montmorillonite is 7.5%; the passivating effect for Cu, Pb and Zn is 30.6%, 38.3% and 19.6%, respectively. The composting pile can maintain high temperature (>50 °C) for six days and the highest temperature, 65 °C can be achieved. The germination index is above 90% which conforms to the harmless standards.

Keywords: composting; heavy metal; montmorillonite; passivation