

Natural adsorbents to remove nutrients from swine facility effluent

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Evaluation of the efficiency of a natural clinoptilolite-mordenite zeolite to remove nitrogen from swine effluent

Abstract

Confined swine facilities create great environmental concern due to the generation of highly concentrated effluents. Technologies applied for the treatment of such residues were adapted from domestic wastewater treatment systems. However, as swine wastewater has an initial concentration which is much higher than ordinary wastewater, the quality standard established by Brazilian Legislation cannot be reached through usual treatment technologies, mainly for nutrients. This work evaluated the efficiency of a natural clinoptilolite-mordenite zeolite to remove nitrogen from synthetic swine effluent in pH = 5.0; 6.0 and 7.0.

It was demonstrated that in this pH range, there was no significant differences in the kinetic of adsorption for different pH levels. Additionally, an experiment was run using swine facilities wastewater previously treated in a compact unit. Results have shown that zeolite removed 89% of N-NH₃, 88% of potassium and 61% of phosphorus after 60 minutes.

Keywords:

livestock wastewater, pollutant abatement, zeolite



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