

Development of Novel Sequence for Swine Wastewater Treatment with Respect to Recycle of Useful Resources

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Among the pollutants in swine wastewater, phosphorus is mainly produced via mining phosphate rock categorized into a supply-risk mineral in Europe. One of methods to overcome the phosphorus depletion would be recycling through diverse techniques among which struvite precipitation from wastewater stream has been widely studied so far. The present study performed to assess a newly designed sequence of processes including struvite production unit as slow release fertilizer production. The sequence of processes was composed of "Liquid composting tank(A), Struvite production unit(B), Electrochemical reaction(C)". According to the unit processes, the $\text{NH}_4\text{-N}$ concentration of 3,454 mg/L in raw manure stepwise decreases 989, 549, 43 mg/L in each reaction. Most $\text{NH}_4\text{-N}$ was removed in (A) and (C) showed the sophisticated decrease of $\text{NH}_4\text{-N}$ concentration. The NH_4^+ and PO_4^{3-} were recovered in the form of struvite with addition of Mg source. The removal efficiencies in all the parameters showed over 90% except total solids (79.4%). The proposed sequence of processes could be the solution of nutrient management for swine manure.