Development of Modified Clay for Designing Sustainable Slow Release Fertilizer

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The feasibility of modified clay as a carrier for slow release of nitrogen (N) was investigated. Montmorillonite, saponite, and kaolinite were modified using chitosan biopolymer and methenamine over intercalation method. Modified materials were thoroughly characterized using X-ray diffraction, Fourier transform infrared, differential thermal analysis and scanning electron microscopy to study the effect of surfactant modification. Adsorption-desorption study of N from urea was observed. The desorption experiment was performed in the constant flow percolation reactor. The study reports that modified clays give the better adsorption and also give longer time N supply compared to raw clays. Kinetics and thermodynamic of the adsorption-desorption study in relation to the physicochemical character of the material is presented.

References

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Short biography:

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Research Topics:
- Slow Release Fertilizer Based on Polymer-Clay Composite Superadsorbent
- Green Chemical Conversion using Microwave Assisted Organic Reaction Approach
- Ceramic Membrane Preparation Using TiO$_2$-Clay Composite for Water Desinfection
- Biogenic Silica from Agricultural Waste for Functional Materials
- Synthesis of Nanoparticles using Plant Extracts

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