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Sorption of nitrate (NH_4NO_3) and phosphate (KH_2PO_4) on pure and surface modified forms of Mordenite and zeolite-A in liquid-solid system: A comparative study

Masood ayoub kaloo, Bilal Ahmad Bhat, and Sheikh Abdul Majid
J&K Govt. Degree College, India

N O_3^- and H_2PO_4^- are negatively charged ions and the soil particles have a net negative charge as well, these are not strongly retained in the soil. In addition NO_3^- and H_2PO_4^- are very mobile and soluble in water. Consequently these compounds are susceptible to be leached through the soil profile to groundwater and thus are made unavailable to plants for longer time. When high NO_3^- and H_2PO_4^- content waters reach lake or any other water body, growth of aquatic plants is enhanced causing depleted oxygen levels and as those plants die, they are decomposed by microorganisms. The potential leaching of these nutrients can be decreased by creating sorptive or immobilizing zones in the soil by the incorporation of the appropriate sorbent in the affected area of soil. So slow release fertilizers (SRFs) are excellent alternatives to soluble fertilizers because nutrients are released at a slower rate throughout the season and thus plants are able to take up most of the nutrients without waste by leaching.

Zeolites are aluminosilicate minerals, have extremely high

adsorption capacity and good catalytic properties with excellent chemical and thermal stability. They are thermally stable and have good resistance to most chemicals. Results of the exploratory investigation of a group of scientists indicate that acid-activated clinoptilolitic tuff could be considered a suitable material for removing atrazine and similar chemical compounds from water. Similarly systematic adsorption tests were carried out by S. Kolakovic et. al to determine the efficiency of organo-zeolite for removal of atrazine, lindane and diazinone from water. Clinoptilolite based separation was designed and developed for more efficient and cost effective water purification process.

In this presentation, we will discuss sorption studies of nitrate (NH_4NO_3) and phosphate (KH_2PO_4) by two zeolites viz, mordenite $[\text{Na}+8 (\text{H}_2\text{O})_{24}] [\text{Al}_8\text{Si}_4\text{O}_{96}]$ -MOR and zeolite-A, $[\text{Na}+12 (\text{H}_2\text{O})_{27}]_8 [\text{Al}_{12}\text{Si}_{12} \text{O}_{48}]_8$ -LTA synthesized hydrothermally

e: aparnavi@buffalo.edu