ORGANO-CLAYS AND NANOSPONGES FOR ACQUIFER BIOREMEDIATION: ADSORPTION AND DEGRADATION OF TRICLOPYR

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The environmental problems associated with the presence of pesticides in the soil and in ground water are becoming increasingly more important. Many compounds are not retained by soil colloids and tend be carried by water seepage to the water table. Moreover, the likelihood of ground water being contaminated is increased by the low degradability of the molecules To avoid this problem, mitigation techniques have been proposed that consist in creating barriers made of suitable materials to facilitate the adsorption and degradation of the pollutants. Recent studies have suggested that organo-clays have a high water decontamination potential due to the fact that they can adsorb considerable quantities of organic compounds. Nano sponges are hyper cross-linked polymers based on cyclo-dextrins. They can include a large quantity of molecules of suitable polarity and dimension. Preliminary studies have shown that nano sponges can adsorb pesticides with different polarities. The work aims at evaluating the capacity of some organo-clays and one nano sponge to adsorb the herbicide, triclopyr. Triclopyr was chosen because it is a good example of a moderately mobile, leacheable, molecule . The rate of degradation of the molecule in the soil, with and without the presence of the materials under examination, was also determined. Both the organo-clays and the nano sponges adsorbed more than 90% of the herbicide. When added to the soil, the materials accelerated the degradation of triclopyr. These results lead us to suggest that they be used in creating reactive barriers for the remediation of soils and aquifers.

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