SORPTION AND DEGRADATION OF CARBARYL ON REFERENCE SMECTITE. (S09-arroyo095344-Poster)

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Abstract:

The sorption and degradation of carbaryl (1-naphthyl, N-methyl carbamate) in aqueous slurries of the reference smectite K-SWy-2 were investigated at pH 6.8. K-SWy-2 was used without prior sedimentation. The major hydrolysis product of carbaryl was 1-naphthol, and both compounds were determined in the aqueous phase by high performance liquid chromatography. Within 48 hours, ~90% of carbaryl and 1-naphthol had disappeared from aqueous solution and were presumed sorbed by K-SWy-2 (up to 3.0 mg/g clay). However, quantities of carbaryl and 1-naphthol that could be extracted from K-SWy-2 by methanol were small. To quantitate the distribution of carbaryl in K-SWy-2 slurries, 14C-ring labeled carbaryl was used. After 48 hours of equilibrium, 14C-activity in the aqueous phase was ~12% of the total 14C-activity added. Methanol extracted ~25% of the 14C-activity adsorbed by the clay (or 22.5% of the total 14C-activity added). Approximately 66% of the total 14C-activity added remained unextractable. K-SWy-2 had decreased hydrolytic activity when the clay sample was purified by sedimentation prior to use. The influence of clay mineralogy on sorption and hydrolysis processes is being further investigated by x-ray diffraction and scanning electron microscopy.

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