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# Phosphate Transport in Illite Due to Consolidation

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**Abstract:** The conditions were studied under which consolidation loading caused the release of phosphate from a saturated illite clay.  $P^{32}$  tracer techniques were employed to follow the movement of phosphate in composite samples composed of tagged and untagged portions. The samples, initially consolidated to  $1 \cdot 0 \text{ kg cm}^{-2}$  stress were reconsolidated to  $0 \cdot 1$ ,  $0 \cdot 5$ , 2, 4 and  $8 \text{ kg cm}^{-2}$  stress and the transport of phosphate was monitored by counting the radioactivity of  $0 \cdot 01$ -in. thick sections sliced parallel to the major principal plane. Corrections were applied for  $P^{32}$ - $P^{31}$  self-diffusion. It was found that: (1) for low phosphate concentrations there was no observable transport due to consolidation type flow; (2) for high phosphate concentrations and for stresses less than or equal to the preconsolidation load there was no observable transport due to consolidation type flow; and (3) for high phosphate concentrations and for loads above the preconsolidation load there was detectable transport of phosphate, presumably due to the consolidation flow. A mechanism based on self-diffusion plus uniform flow was able to semi-quantatively explain the test results.

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