

er a limited range of interlayer ionic composition. These energy barriers cause hysteresis in crystalline swelling, which in turn causes hysteresis in cation exchange. Results are presented for an experiment involving Ba-Mg exchange on a synthetic fluoro-hectorite. The results demonstrate key aspects of the proposed model, including a correlation between measured selectivity coefficients and basal spacings ($R^2 = 0.85$), an abrupt change in basal spacing that corresponds with an abrupt change in selectivity and corresponding hysteresis in crystalline swelling and cation exchange selectivity. The results also demonstrate increased selectivity for the preferred cation (Ba) at high solution mole fraction of the preferred cation. This trend is opposite of that observed for heterogeneous natural smectites but consistent with predictions of the model for a homogeneous smectite.

Key Words: Cation Exchange Selectivity • Crystalline Swelling • Demixing • Fixation • Ion Exchange Hysteresis • Layer Charge • Smectite

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