Theme Session Title: The Isotopy of Clay Minerals – Mysteries in the Sheets

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This session invites contributions on the isotopic compositions of clay minerals and associated hydrous phases, and the interpretation and application of these signals. Oxygen and hydrogen isotopes of clay minerals provide a signature of the temperature, isotopic composition and source of water in weathering, diagenetic and hydrothermal environments, and can contain key climate signals. We seek submissions presenting new or improved O or H isotope clay-water geothermometers, investigating intra-clay O (H) isotopic fractionation, evaluating isotopic exchange on a crystallochemical basis, and more generally advancing knowledge of clay isotope crystallochemistry. Exploration of non-traditional stable isotope (e.g., Fe, Mg, Ca, Zn, Cu) clay mineral systematics is also growing. We seek contributions examining the magnitude and causes of isotopic fractionation of these elements in clays (e.g., structural position, sorption and sorption sites, pH, and oxidation state), and more broadly, the implications for water isotopic composition and the global budgets of these elements. Isotope geochronometers (e.g., K-Ar, Ar-Ar, Rb-Sr and Sm-Nd) and associated radiogenic products can yield the age of clay minerals, associated weathering and diagenetic processes, and a deeper understanding of clay mineral transformations. Submissions addressing fundamental advances in the measurement and interpretation of these signals are particularly welcome. In summary, this session invites papers spanning all aspects of the isotopy of clay minerals. The session is unified by an emphasis on new insights into clay isotope systematics and/or innovative approaches to understanding key processes in the Earth System and beyond.