

Kinetics of Soil Chemical Processes: Future Importance in
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Unfortunately, until the last two decades soil and environmental chemists and engineers did not appreciate the immense importance of time-dependent reactions in natural systems. In fact, it is now clearly recognized that to fully understand the dynamic interactions of metals, nutrients, radionuclides, pesticides, and other organic chemicals in subsurface environments and to predict their fate with time, a knowledge of the kinetics of these reactions is important. This paper will review past successes in applying chemical kinetics to heterogeneous systems, in developing methods to measure fast and slow reactions, and in modeling the rates of soil chemical reactions. Future research needs will be emphasized including the development of more appropriate and precise kinetic models that describe both chemical kinetics and transport phenomena, a better understanding of the kinetics of desorption and dissolution reactions, the effect of aging on the rates of reactions, and monitoring of reaction rates using in-situ spectroscopic and microscopic techniques.