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# Advances in Geoelectrical Monitoring of Solute Transport in Dual-Domain Media

Frederick Day-Lewis
United States Geological Survey, Hydrogeophysics Branch, Storrs Mansfield, United States (daylewis@usgs.gov)

Aquifer systems that exhibit dual-domain (i.e. mobile/immobile) transport behavior present challenging settings for characterization, groundwater remediation, and management of groundwater resources. A number of modeling approaches exist for solute transport in dual-domain systems, with most approaches representing the aquifer system as comprising (1) mobile pore space (i.e. the mobile domain), where advection and dispersion occur, and (2) immobile pore space (i.e. the immobile domain) where diffusion dominates. The model parameters governing the exchange of solute between mobile and immobile pore spaces (or possibly between immobile pore spaces) are difficult to measure or infer using conventional hydrologic field methods because conventional sampling interrogates primarily the mobile domain. Over the last decade, a growing body of research has demonstrated the sensitivity of geoelectrical measurements to ionic tracers in immobile pore spaces. Capitalizing on this sensitivity, new experimental and data-analysis methods have been developed to monitor mobile/immobile exchange and improve parameter estimation for dual-domain systems. Here, we first review the previous decade of research on the development and application of geoelectrical methods in dual-domain media, including laboratory experiments, field experiments, and modeling frameworks; these methods are applied in fractured-rock, unconsolidated materials, and stream and lake beds. Second, we present new pore-scale simulations aimed at assessing the use of complex resistivity measurements to further improve our understanding of dual-domain transport.