

Surfaces, double layers, and adsorption II: the interaction of H₂O with mineral surfaces

The model of Schindler and Stumm (1987) assumes the surface of an oxide mineral at which both cations and anions are exposed (see Panel 1 below). Because cations almost inevitably have greater ionic potential than anions, the charge of the cations dominates the interaction of the surface with H₂O molecules by attracting the negative ends of those molecules (as shown in Panel 2 below).

Dissociation of the H₂O molecules and transfer of one H⁺ ion from each H₂O to an adjacent O²⁻ of the mineral

surface creates a surface of positive charge (as shown in Panel 3). However, as the next page in this series shows, further pH-dependent dissociation of H⁺ may leave the surface with a net negative charge to which cations may be attracted.

"Oxide" is used in quotation marks here as a reminder that the model might be used for an O²⁻-bearing mineral, such as a carbonate or sulfate - and in fact perhaps for sulfides as well.

