

IS SOLUBILITY THE ONLY CONTROL ON SOLUTE CONCENTRATIONS?

- The answer is NO! Solubility often controls the concentrations of major solutes such as Si, Ca, and Mg, and some minor or trace solutes such as Al and Fe.
- However, for many trace elements, sorption processes maintain concentrations below saturation with respect to minerals.
- In other words, sorption is a means to remove solutes even when the solution is undersaturated with any relevant solids.

Mineral Surfaces

- Minerals which are precipitated can also interact with other molecules and ions at the surface
- Attraction between a particular mineral surface and an ion or molecule due to:
 - Electrostatic interaction (unlike charges attract)
 - Hydrophobic/hydrophilic interactions
 - Specific bonding reactions at the surface

DEFINITIONS

- ***Sorption*** - removal of solutes from solution onto mineral surfaces.
- ***Sorbate*** - the species removed from solution.
- ***Sorbent*** - the solid onto which solution species are sorbed.
- **Three types of sorption:**
 - ***Adsorption*** - solutes held at the mineral surface as a hydrated species.
 - ***Absorption*** - solute incorporated into the mineral structure at the surface.
 - ***Ion exchange*** - when an ion becomes sorbed to a surface by changing places with a similarly charged ion previously residing on the sorbent.