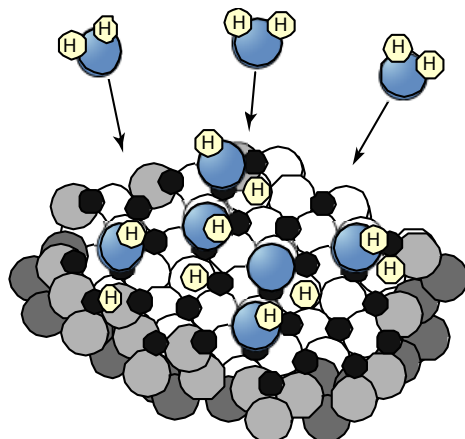


Importance of Solid/Water Interface Reactions in Modern Technology and Environmental Chemistry



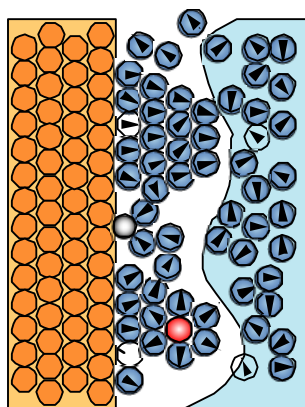
$\text{H}_2\text{O}/\alpha\text{-Fe}_2\text{O}_3$ (0001)

Modern Technology

- Heterogeneous Catalysis
- Corrosion Inhibition
- Chemical Sensors
- Energy Storage and Conversion
- Semiconductor Device Fabrication
- Chip-based Biotechnology

“From the point of view of the chemist, the structure of the surface must be of utmost importance, for the chemical reactions in which solids take part are practically always surface reactions.”

Irving Langmuir, 1916



EDL at Metal Oxide-Water Interface

Environmental Chemistry/Geochemistry

- Speciation, Transformation, and Sequestration of Environmental Pollutants
- Mobility and Potential Bioavailability of Pollutants in Aquatic Systems
- Availability of Plant Nutrients in Soils and Waters
- Composition of Natural Waters
- Chemical and Biological Weathering of Natural Solids
- Acid Mine Drainage
- Corrosion of Cements, Building Stones, and Metals

“Almost all the problems associated with understanding the processes that control the composition of our environment concern interfaces, above all, the interfaces of water with naturally occurring solids.”

Werner Stumm, 1987