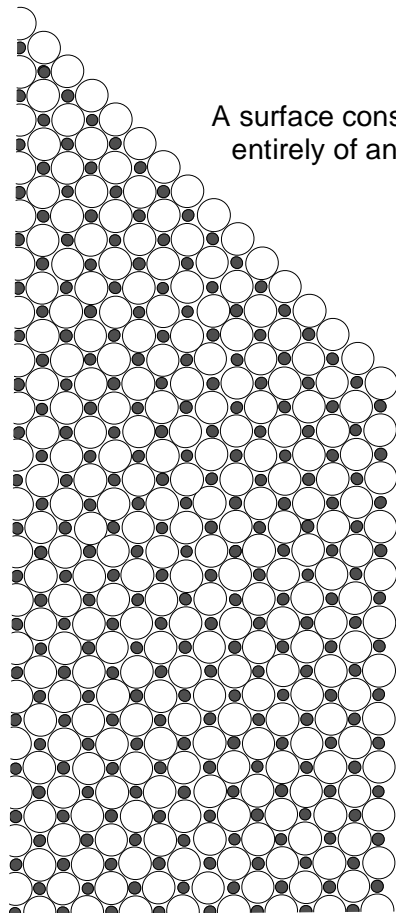


Surfaces, double layers, and adsorption VII: different surfaces in one crystal

We commonly talk about adsorption of solutes on mineral surfaces with the assumption that all surfaces of a particular mineral are the same. However, cursory examination of the sketch below at left shows that the two different surfaces present different assemblages of the mineral's constituent atoms. As a result, the adsorptive character of these surfaces might be quite different. This effect has been shown to be significant in calcite - see Reeder, R.J., and Grams, J.C., 1987,

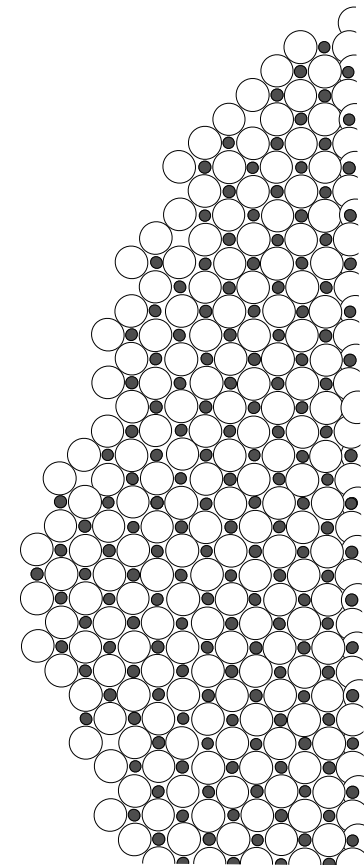
Sector zoning in calcite cement crystals: implications for trace element distributions in carbonates: *Geochemica et Cosmochimica Acta*, v. 51, p, 187-194.

The models presented thus far in this series also assume uniform mineral surfaces. The sketch below at right shows an irregular surface that might result from abrasion and/or weathering. The overall boundary of this crystal consists of many kinds of surfaces, each of which might behave differently as a substrate for adsorption. Characterization of this material would thus be far more complex than characterization of the single uniform surfaces depicted previously in this series of pages. Let the games begin!



A surface consisting entirely of anions

A surface with equal proportions of cations and anions



A weathered and/or abraded surface