



Fundamental Aspects of Flotation Chemistry

Lecturer: Prof. Jan D. Miller (University of Utah, USA)

Course description:

The significance of interfacial water structure in the surface chemistry analysis of mineral flotation systems is discussed. Water structure at hydrophobic surfaces is examined based on surface vibrational spectroscopy, x-ray reflectivity measurements, atomic force microscopy, and molecular dynamics simulations. For example sum frequency vibrational spectroscopy (SFVS) is used to describe hydrogen bonding of interfacial water molecules at hydrophilic and hydrophobic surfaces.

The SFVS spectra indicate that a very ordered water structure exists in water films at the hydrophilic silica surface during contact with a bubble and that the extent of hydrogen bonding increases with an increase in contact pressure.

In contrast, the SFVS spectra of water at a hydrophobic silica surface show a lack of hydrogen bonding and are characterized by a distinct absorption at about 3700 cm⁻¹ similar to the spectrum of the air/water interface. These results suggest the presence of a water void, or water exclusion zone, at the hydrophobic surface, as supported by X-ray reflectivity measurements reported in the literature, by atomic force microscopy, and by the results from molecular dynamics simulations.

In view of the significance of interfacial water structure, the flotation chemistry features of different mineral classes are discussed including sulfides and native metals, oxides and silicates, semi-soluble salts, and soluble salt minerals.

TERMINY WYKŁADÓW			
Data	Dzień tygodnia	Godzina	Sala
13 maj 2013	poniedziałek	9.00-12.00	300 (Gmach Główny)
14 maj 2013	wtorek	9.00-12.00	300 (Gmach Główny)
15 maj 2013	środa	9.00-12.00	300 (Gmach Główny)
16 maj 2013	czwartek	9.00-12.00	300 (Gmach Główny)
17 maj 2013	piątek	9.00-12.00	300 (Gmach Główny)