IAP Seminar

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Tuesday, 8th November 2022, 16:00 s.t.
TU Wien, Institut für Angewandte Physik, E134
1040 Wien, Wiedner Hauptstraße 8-10
Yellow Tower „B“, 5th floor, SEM.R. DB gelb 05 B

The seminar will be also held as a Zoom Meeting
https://tuwien.zoom.us/j/96062751637?pwd=ZkRUWnlkUFFZb2pEdm55ZzFteTBNdz09
Meeting ID: 960 6275 1637
Password: 9ANd8XWj

Experiences and experiments with single crystals with focus on a-Al_2O_3

Work on single crystals at INE was initiated to better understand the interaction of radionuclides with mineral surfaces. Compared to particles, single crystals have the advantage that surface structure and site densities are known. First steps included elaborating a cleaning procedure for a range of a-Al_2O_3 faces and subsequent uptake and spectroscopic experiments with trivalent actinides. Surprisingly, uptake was strongest on the face that was expected to be the least reactive, i.e., the (0001) face. On this face, the spectroscopy also showed different patterns than on the other faces studied. Subsequently, additional effort was made to gain more understanding of the (0001) face which exposes only doubly-co-ordinated oxygens. Literature suggested an unexpectedly low isoelectric point, which was confirmed by own experiments. The interpretation of a set of published data was possible by assuming a water layer on the surface that would turn the hydrophilic surface hydrophobic. In a subsequent study, a systematic study on effects of, e.g. the origin of the crystals, the miscut, or the pretreatment was carried out using various methods. Moreover, the adsorption of surfactants has become of interest, involving a multimethod approach. The ultimate goal is to derive thermodynamic models, and first steps in this direction have been taken for isostructural hematite.

All interested colleagues are welcome to this seminar lecture
(45 min. presentation followed by discussion).

Friedrich Aumayr
(LVA-Leiter)

Ulrike Diebold
(Seminar Chair)