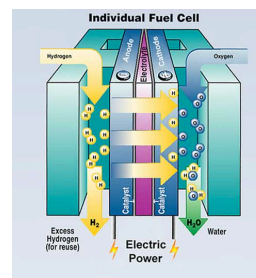




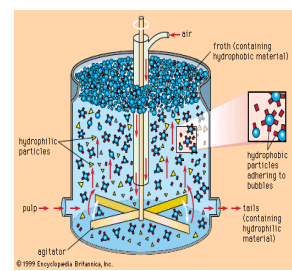
# Physics of metal/electrolyte interfaces

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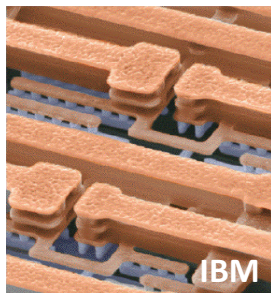
Processes at solid/liquid interfaces are of enormous technological importance. Examples of large scale applications are galvanisation and passivation for corrosion inhibition, batteries and fuel cells for energy storage and conversion, electro-catalysis and flotation.



Fuel cell

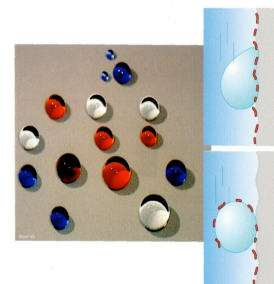


Flotation



Integrated circuit

Nowadays nanoscale integrated circuits are produced electro-chemically, by the so-called “Damascene process”. Special coatings lead to super-hydrophobic and self-cleaning surfaces (“Lotus – effect”).



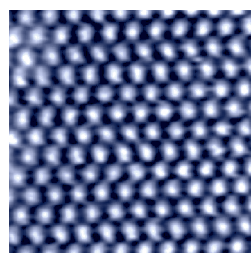
Superhydrophobicity

In order to understand and optimize these processes detailed fundamental research is required.

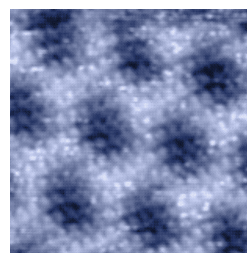
Only since recently microscopic and spectroscopic methods exist, which enable to study properties and processes at solid/liquid interfaces with highest precision, even with atomic resolution.

This lecture gives an overview over the basic concepts, the state-of-the-art methods and the current understanding of the scientifically exciting and technologically highly relevant research area of metal/electrolyte interfaces.

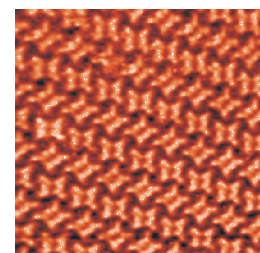
Here you see atomically resolved Scanning Tunneling Microscopy (STM) images in solution



Cu(111) single crystal electrode



Cu(111) electrode in H<sub>2</sub>SO<sub>4</sub> acid



Porphyrin molecules on Cu(111)