

A scanning force microscope for in situ observation of electrochemical processes

E.M. Siebel, U. Memmert, R. Vogel, U. Hartmann

A scanning force microscope (SFM) for electrochemical applications, based on an optical fiber interferometer for force detection, is developed. Cu bulk deposition and dissolution on polycrystalline Au samples were used to demonstrate the performance of the instrument. The time dependence of the nucleation and deposition of Cu grains and their dissolution was monitored by one-dimensional scanning during the reaction. The data show that SFM in an electrochemical environment can be used to investigate inhomogeneous processes in situ on the micron scale. Problems due to electrochemical processes occurring on the SFM cantilevers are, however, of significance and require special attention.