FIB Based Microfabrication Technique For A Novel Type of Scanning Electrochemical Microscopy Probes

A. Lugstein, E. Bertagnolli
Institut für Festkörperelektronik
Technische Universität Wien
Ordinariat für Halbleitertechnologie/Siliziumtechnologie

C. Kranz, B. Mizaikoff
Institut für Analytische Chemie
Technische Universität Wien

How to Solve the Constant Distance Problem?
- Commercial AFM-Tip
- Deposition of an electroactive layer
- Insulation of the metal film with a chemically inert layer
- Partial removal of the insulation layer
- Creation of a defined microelectrode
- Re-shaping of the AFM-Tip
- Well-defined and constant distance between microelectrode and sample surface
Conclusion

- Successful Integration of a Microelectrode in an AFM-Tip
- Simultaneous mapping of topographical and laterally resolved electrochemical information
- Reproducible fabrication of sub-microelectrodes by FIB-techniques
- Invariable and constant distance between microelectrode and sample surface

Outlook

- Improvement of insulation towards thinner films
- Variation of electrode geometry
- Multiple electrode configuration