Improved microtips for scanning probe microscopy

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Improved electrochemical techniques for the reproducible fabrication of sharp metallic tips are presented. Radii of curvature down to 10 nm make the tips particularly suitable for scanning tunneling microscopy (STM) and atomic force microscopy (AFM). Additionally, simple methods are developed for preparing AFM cantilevers. A new type of spherical probe suitable for long-range scanning force microscopy has been fabricated. The probes consist of nearly perfect spheres with adjustable radii between about 50 and several 100 nm deposited at the very tip of tiny probe holders. Both probe and probe holder may consist of any metal. First experimental investigations confirm that the spherical probes are particularly suitable for van der Waals and magnetic force microscopy.