



グローバル COE 物質科学イノベーション講演会

演 題 : Utilization of Anodizing Technologies in Microfabrication

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場 所 : 工学部材料・化学棟中会議室 (MC102)

共 催 : 表面技術協会北海道支部, 腐食防食協会北海道支部

Abstract: Microfabrication is a collection of technologies which are utilized in making microdevices. To fabricate a microdevice, many processes must be performed, one after the other, many times repeatedly. These processes typically include depositing a film, patterning the film with the desired micro features, and removing (or etching) portions of the film. Microfabricated devices include integrated circuits (microchips), microelectromechanical systems (MEMS), laser diodes, flat panel displays, sensors (microsensors), nanotubes, fuel cells, etc. Basic processes comprise deposition or growth, patterning, etching, and others (doping, planarization, wire bonding). During the last few decades numerous efforts of the anodizing groups worldwide have been devoted to introducing electrochemical anodizing technologies into the micromanufacturing of commercially available or newly developed electronic devices or system parts. In this lecture, a review will be presented of the attempts of the Anodizing Research Group of BSUIR to contribute to making anodization of valve-metal thin films compatible with standard and emerging micromachining technologies in order to improve the devices' performances and possibly create new devices. The focus will be on utilizing the anodizing of various valve metals and metal stacks, including Al, Ta, Nb, Ti, W, and Zr in fabricating thin-film electronic passives (integral resistors, capacitors, interconnection), multilevel metallization and the whole design of hybrid and semiconductor microchips, gas microsensors, prototypes of a Li-metal rechargeable battery and an electrolytic capacitor, and various kinds of self-organized metal-oxide nanostructured coatings for multipurpose applications. Relating to certain coverings, the mechanisms of anodic film growth and the results of analytically examining the films will be discussed.

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