

Autocatalytically electroless deposition of IrO_x for bio-electrochemical interface application

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Abstract

Implantable bioelectronic devices have been considered as a promising technology to remedy diseases caused by neuronal degeneration. One of the critical components in an implantable biomedical device is the bio-stimulating electrode for neuron stimulation. Among many possible materials proposed, the iridium oxide has attracted the most attention for its impressive electrochemical properties and superb biocompatibility. In our laboratory, we have explored a wide variety of wet chemical baths to fabricate iridium oxide thin film atop of TiW microelectrode arrays of artificial retina chips. The film thickness is readily adjusted and selectively deposited on patterned microelectrode array. Surface morphology, crystallinity, electrochemical properties, deposition mechanism, and atomic structure of iridium oxide are characterized using SEM, AFM, XRD, potentiostat, and XAS, respectively.

Keywords – Iridium oxide, Electroless deposition, Implantable Bioelectronics; Bio-stimulating electrodes