MEXT-Supported Program for the Strategic Research Foundation at Private Universities
"Developmet of next-genereation medical technologies using ultra-thin polymer films"

MNTC Seminar vol.41

13 FRIDAY OCTOBER 2017

15:30 – 16:30

Micro/Nano Technology Center
Building 12

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"Pattern Formation during Electrodeposition of Alloys"

The increase in the content of the alloying element in electrodeposited alloys reflects in the changes of their phase composition, when the saturation limit of the lattice of the basic metal is reached. At higher percentages, the excess amount of the alloying element forms one or more new, richer in this element phases. The coatings become multi phase, heterogeneous and their physical-mechanical properties change. Sometimes an ordered distribution of the different phases of the heterogeneous alloy coating could be observed.

Examples of similar self-organization phenomena during electrodeposition of different alloy systems, such as Ag-Sb, Ag-Bi, Ag-In, Ag-Sn, Ag-Cd, Cu-Sb and In-Co, resulting in pattern formation and formation of spatio-temporal structures on the surface of the obtained coatings are presented and compared.

Instabilities resulting in potential or current oscillations are registered in most of the investigated systems. The phase composition of the alloy coatings and especially of the observed pattern is determined by conventional by x-ray technique and also by anodic linear sweep voltammetry.

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