



Defence announcement

Public Defence on 8th Dec 2023

Direct fabrication of microstructured films for electrochemical applications by physical vapor deposition

Title of the doctoral thesis	Exploring the envelope of physical vapor deposition: Nano- and microstructured films for electrochemical applications
Content of the doctoral thesis	Physical vapor deposition (PVD) is a widely used method in the industry for producing high-quality films with flat surfaces. However, when these films are used as electrodes in electrochemistry, their smooth surfaces limit electrochemical performance because there is less surface area available for chemical reactions. In the first part, the nanostructure of PVD deposited flat carbon films is modified to improve their performance in electrochemical sensing applications. In the second part, the PVD method is further adapted to create titanium oxide films with large surface areas and exotic microstructures, ideal for applications like photocatalysis and microbatteries. This work introduces novel PVD methods and phenomena, enabling the direct fabrication of large microstructures not typically achievable with conventional PVD methods. These discoveries and insights push the boundaries of what can be achieved with PVD methods.
Field of the doctoral thesis	Materials Science
Doctoral candidate and contact information	M.Sc. (Tech.) Jarkko Etula Jarkko.etula(at)aalto.fi
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Place of public defence	Lecture hall U006 Ekonominaukio 1, 02150 Espoo
Opponent(s)	Professor Kostas Sarakinos, University of Helsinki, Finland
Custos	Professor Tomi Laurila, Aalto University School of Chemical Engineering
Link to electronic thesis	https://aaltodoc.aalto.fi/handle/123456789/51
Keywords	Physical vapor deposition, Thin films, Nanostructure, Microstructure, Electrochemistry