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Area Selective Plasma Enhanced Chemical Vapor Deposition of Silicon on Silicon Nitride and Aluminum Oxide. GHEWA AKIKI, DANIEL SUCHET, DMITRI DAINEKA, LPICM-CNRS, Ecole Polytechnique, Institut Polytechnique de Paris, SERGEJ FILONOVICH, TOTAL GRP, PAVEL BULKIN, ERIK JOHNSON, LPICM-CNRS, Ecole Polytechnique, Institut Polytechnique de Paris — The use of non-sinusoidal voltage waveforms with a fluorinated silicon plasma precursor has been deployed in the past to produce an electrode-selective silicon deposition process [1]. In this work, we aim to demonstrate an area selective Plasma Enhanced Chemical Vapor Deposition (PECVD) using a standard 13.56 MHz radio frequency excitation source and an Ar/SiF4/H2 plasma chemistry. We found that for specific plasma parameters, a microcrystalline silicon film is selectively grown on a SiNx surface while the AlOx surface remains pristine. This plasma chemistry plays a crucial role in this selectivity as the surface processes strongly depend on the deposition/etching balance, as controlled by the H2 flow rate (The growth mechanism and techniques of this chemistry are detailed in reference [2]). The deposition selectivity on a patterned substrate containing both SiNx and AlOx areas, as well as the influence of the plasma parameters, have been studied and will be presented. The analysis is accomplished by in-situ spectroscopic ellipsometry and Scanning Electron Microscopy (SEM). [1] J. Wang and E.V. Johnson, Plasma Sources Sci. Technol. 26 (2017) 01LT01. [2] Dornstetter JC, Bruneau B, Bulkin P, Johnson EV, Roca i Cabarrocas P, J. Chem. Phys. 140, 234706 (2014

Ghewa Akiki
LPICM-CNRS, Ecole Polytechnique, Institut Polytechnique de Paris

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