MASK-FREE LOCALIZED GRAFTING OF ORGANICS AT A MICRONIC OR SUBMICRONIC SCALE ON COMPOSITE SUBSTRATES.

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This work presents a new one-step process, enabling the mask-free localized functionalization by organics of the conducting or semiconducting parts of composite surfaces at a micronic or submicronic scale. The functionalization is carried out via the electro-grafting of suited precursors, which guarantees that the resolution is that of the pre- existent pattern, even when the whole surface is dipped into the reaction medium. The presumed mechanism is that of a regio-selective extraction of electrons from the surface, according to its apparent, local, work function in solution. Three samples series are considered : (i) "macroscopic" samples of composite surfaces (Si with native oxide layer or thick silica covered on half by gold); (ii) "microscopic" samples (interdigited gold combs on thick silica with different distances between two subsequent electrodes (128, 32, 8 and 0.5m)); and (iii) microelectronic substrates (n/p diode sensors with a pre-existent pattern at a micronic scale). On each sample, the localization of the organic grafts is studied by XPS, IR and AFM methods.