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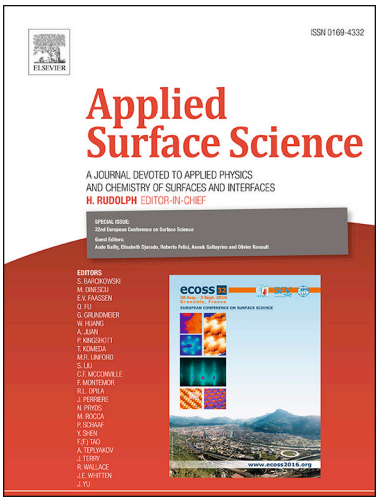

Full Length Article

Indirect Photopatterning of Functionalized Organic Monolayers via Copper-Catalyzed "Click Chemistry"

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Indirect Photopatterning of Functionalized Organic Monolayers via Copper-Catalyzed "Click Chemistry"

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Abstract:

Solution-based lithographic surface modification of an organic monolayer on a solid substrate is attained based on selective area photo-reduction of copper (II) to copper (I) to catalyze the azide-alkyne dipolar cycloaddition "click" reaction. X-ray photoelectron spectroscopy is used to confirm patterning, and spectroscopic results are analyzed and supplemented with computational models to confirm the surface chemistry. It is determined that this surface modification approach requires irradiation of the solid substrate with all necessary components present in solution. This method requires only minutes of irradiation to result in spatial and temporal control of the covalent surface functionalization of a monolayer and offers the potential for wavelength tunability that may be desirable in many applications utilizing organic monolayers.

Keywords:

Photopatterning, surface chemical modification, surface functionalization

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