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Atmospheric Pressure Microplasma for Post-Synthesis Treatment of Silicon Nanocrystals for Photovoltaic Applications TAMILSELVAN VELUSAMY, CONOR ROCKS, SOMAK MITRA, Nanotechnology & Integrated Bio-Engineering Centre (NIBEC), University of Ulster, Jordanstown, UK, VLADIMIR SVRCEK, Research Center for Photovoltaic Technologies, AIST, Tsukuba, 305-8568, Japan, PAUL MAGUIRE, DAVIDE MARIOTTI, Nanotechnology & Integrated Bio-Engineering Centre (NIBEC), University of Ulster, Jordanstown, UK, VLADIMIR SVRCEK COLLABORATION — We report the effects of plasma treatment on the optoelectronic properties of silicon nanocrystals (SiNCs) synthesized by electrochemical etching. A simple atmospheric pressure microplasma is used to tailor the functionalization of SiNCs and improve their characteristics in films. The SiNCs are spin coated on glass substrates at different thickness and the effects of the microplasma treatment on the SiNCs in liquid and in films are investigated. The surface chemistry induced by the plasma treatment is also studied and possible plasma-activated mechanisms are suggested. In order to assess the effects of the plasma treatment we perform ultraviolet-visible absorption and photoluminescence measurements together with kelvin probe and electrical measurements of the films.

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