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The modification of nanocomposite hybrid polymer surfaces by exposure to oxygen containing plasmas ASHLEY FIGUEIREDO, Sweet Briar College, KATHERINE ZIMMERMANN, BRIAN AUGUSTINE, CHRIS HUGHES, James Madison University, CHARLES CHUSUEI, University of Missouri-Rolla — The wetting properties of the surfaces of the nanocomposite hybrid polymer poly[(propylmethacryl-heptaisobutyl- polyhedral oligomeric silsequioxane)-co-(methylmethacrylate)] (POSS-PMMA)has been studied before and after exposure to plasmas containing oxygen. The contact angle of water droplets on the surface showed a substantial decrease after plasma exposure indicating an increase in the hydrophilicity of the surface. A model was developed in which the plasma preferentially removed organic material including both the PMMA backbone and isobutyl groups from the corners of the POSS cages leaving behind a surface characterized by the silicon oxide-like POSS material. Measurements of surface concentrations of oxygen, silicon, and carbon by x-ray photoelectron spectroscopy (XPS) showed an increase in the amount of oxygen and silicon compared to carbon and the appropriate chemical shifts were observed in the XPS data to support the model of Si-O enrichment on the surface. Variable angle spectroscopic ellipsometry (VASE) and atomic force microscopy (AFM) measurements also supported the model and these results will be presented.

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