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SE-ThP-2 Plasma and Heat Treatment Response of Carborane Self-Assembled Monolayer on Copper, ***Rupak Thapa***, *L Dorsett, S Malik, R Bale, S Wagner, D Bailey, A Caruso,* University of Missouri-Kansas City*; J Bielefeld, S King,* Intel Corporation*; M Paquette,* University of Missouri-Kansas City

Self-assembled monolayers (SAMs) have a wide variety of applications. These include modifying the properties of metal surfaces to act as protective layers or to enable molecular recognition for sensors. Here, we investigate copper surfaces modified by thiol-carborane SAMs. We use carborane-based boron carbide due to its excellent chemical, thermal, and mechanical properties along with its symmetrical icosahedral shape and capacity to cross-link under the influence of heat or plasma. It has been shown that carborane-based SAMs provide better corrosion resistance on silver and have the ability to change the electronic properties (e.g., work function) of gold and silver. Here, we investigate the influence of plasma and heat on carborane SAMs on copper using in situ ellipsometry, in situ x-ray photoelectron spectroscopy, and water contact angle measurements. We use various plasmas (N_2, O_2, and Ar) at different conditions (power, pressure, and time) to determine how these stabilize, degrade, and/or otherwise modify the SAMs. We also heat the samples to various temperatures and investigate their growth properties and thermal stability. Results suggest that SAMs based on 1,2-dithiol-o-carborane containing two thiol groups are more stable than those based on 9-thiol-m-carborane containing one thiol group.

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