Metallization on modified polymer for high performance on-chip interconnect

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Polymeric surfaces are notoriously hard to metallize and adhere to since they are relatively inert possessing few surface reactive groups and possess a low surface free energy. To improve polymer metallization and polymer-polymer adhesion a myriad of processes have been developed to functionalize polymeric surfaces. Parylene (polymer) as one of low dielectric constant (low-k) materials is being used as replacements for silicon dioxide for interconnect dielectric applications in high performance silicon integrated circuits.
In this work we study the surface reactivity of modified parylene X of films (~200-1300 Å). The surface of the films is investigated with XPS and contact angle goniometry to determine the chemical composition and hydrophobicity of the modified polymer surface. Consequently we investigate the copper electrochemical deposition for metallization on the modified Parylene X sheets. In the study effects of process conditions have been investigated and morphology of the metallized surfaces has been studied by FESEM, XPS, AFM, XRD, and RBS.