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Titel des Beitrags: High-yield metal transfer printing on alkyl bis-phosphonate monolayers

Abstract: The successful transfer printing of thin metal films onto monolayers of aliphatic bisphosphonic acids (bisPAs) is reported. These monolayers were prepared from solution on plasma-grown aluminum oxide, and were compared with analogous monolayers of alkyl monophosphonic acids (monoPAs) for transfer printing efficacy. Water contact angle and AFM measurements indicated uniform films formed from both classes of phosphonic acids. Evaporated Au/Ti films were prepared using patterned polymeric stamps, and were transfer printed onto the various phosphonate monolayers; this process resulted in close to 100% yield for bisPA monolayers, but only poor results were measured for the monoPAs. We attribute efficient printing onto bisPA monolayers to the formation of strong chemical bonds between distal phosphonic acid groups and the stamp-adhered metal film via its native Ti-oxide termination.

Stichworte: Films, Metals, Polymers, Printing, Substrates, Surface topography, Surface treatment, Self-assembled monolayer, alkyl bisphosphonic acid, polymeric stamp, top metal contact, transfer printing