

Effects of pH on Structure in Acid and Base Terminated Thioaromatic Self Assembled Monolayers on Gold Substrates

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We report on the investigation of pH induced electronic changes in thioaromatic self-assembled monolayers. Scanning tunneling microscopy and scanning tunneling spectroscopy were employed at varying pH levels to characterize the behavior of monolayers composed of 4-aminothiophenol, and 4-mercaptobenzoic on Au(111). pH mediated conductivity switching was observed in 4-mercaptobenzoic acid layers, but not in 4-aminothiophenol. This behavior is attributed to pH induced perturbations of a delocalized surface wave function that exists in the 4-mercaptobenzoic acid film.