

## Study on the replacement of adsorbed alkanethiolate on Au with carboxyl-terminated thiol in solution

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There has been extensive work on the binary self-assembled monolayers (SAMs) on Au substrate, especially the replacement of adsorbed alkanethiolate molecules with different functional end groups. We have studied the effect of adsorbed alkyl chain length on the replacement of adsorbed alkanethiolate on Au with carboxyl-terminated thiol in solution. Two different alkanethiol molecules, octanethiol (OT) and octadecanethiol (ODT), were self-assembled on Au substrates and those surfaces were reacted with 11-mercaptoundecanoic acid (MUA) to compare the replacement rates. Contact angle and XPS measurements as well as the cyclic voltammetry of the reductive desorption have been done. In addition, the change of the alkanethiolate pattern formed by a micro-contact printing ( $\mu$ CP) with replacement reaction was investigated using a Lateral Force Microscope (LFM). It was found that the rate of replacement of OT monolayer with MUA is faster than that of ODT monolayer.