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Chemisorption and orientation of Selenopheneon Si(100)-2x1

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We have investigated adsorption of selenophene on Si(100) at room temperature using high resolution photoemission spectroscopy (HRPES) and near edge X-ray absorption fine structure (NEXAFS) in the partial electron yield (PEY) mode. The Si 2p, C 1s, Se 3d spectra of selenophene on Si(100) show that selenophene is nondissociatively chemisorbed on Si(100)-2x1 through [2+2] cycloaddition. NEXAFS has been conducted to characterize the adsorption geometry of selenophene on Si(100). Since the π* orbital of C=C bond show good angular dependence in carbon K-edge NEXAFS spectra, the angle 53±5° determined from NEXAFS spectra. This majority structure is consistent with the [2+2] cycloaddition of selenophene to the dimer of the Si(100)-2×1 surface.