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Adsorption and thermal decomposition of 4-Mercapto-1-butanol on a Si(001)2x1 Surface

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Covalent attachment chemistry of organic molecules on silicon surfaces has been of great interest in surface science. Apart from the fundamental interest, the attachment of organic molecules to the Si surfaces has been one of promising subjects for integrating the wide range of available chemical functionalities of organic molecules with micro- and nano-electronic technology. In this study, the adsorption and thermal decomposition of 4-mercapto-1-butanol (MB) having bi-functional groups of SH and OH on the Si(001)2x1 surface have been investigated using low energy electron diffraction (LEED), X-ray photoelectron spectroscopy (XPS), scanning tunneling microscopy (STM), and thermal desorption spectroscopy (TDS). Lateral adsorption of MB molecule along the Si dimerrow with two different adsorption types by dissociative reactions of both SH and OH was observed. Details of thermal decomposition and desorption of the MB/Si(001)2x1 surface will be discussed.