

The Adsorption of BINOL on Ge(100)

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The adsorption of 1,1'-binaphthyl-2,2'-diol (BINOL) on Ge(100) has been investigated using real-time scanning tunneling microscopy (STM). BINOL has an axial chirality resulting from hindered rotation about single bond, and it contains two twisted aryl groups which can bind with each other as π - π interaction in formation of chiral structure. We can expect two possible adsorption structures depending on the location of aryl groups of BINOL. One expected adsorption configuration is that the aryl groups of BINOL are located on the up-Ge atoms. And the other expected configuration is that the aryl groups are placed on the down-Ge atoms. In our STM images, most of the BINOL molecules are shown as oval shape protrusions on top of the Ge dimer row. The long axis of these protrusions is 7 Å long, parallel to the dimer row direction. Based on the molecular length and the direction of the protrusion, we propose that the BINOL molecules are adsorbed on Ge(100) through Ge-O dative bonds between the O atoms of hydroxyl groups and the down atoms. The BINOL molecules form a well-ordered hexagonal structure at the saturation coverage.