Adsorption Structure of Purine on Ge(100)

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The adsorption of purine molecule onto Ge(100) was investigated using scanning tunneling
microscope (STM). We find that purine molecules adsorb with very high order and selectivity
onto Ge(100) via the formation of multiple Ge-N dative bonds through a Lewis acid-base type
reaction. The filled-state STM image of Ge(100) surface recorded after the exposure of 0.01 ML
purine molecules, the round shape protrusions are attributed to purine molecules and appear to
reside between the buckled dimer rows. The STM image also shows local rearrangements of
the purine adsorbed Ge(100) surface from a c(4x2) to p(2x2) structure. This STM result
indicates that the adsorption of purine on Ge(100) surface proceeds preferentially via multiple
Ge-N dative bondings bewteen three N atoms and the surface dimers. At the saturation
coverage (0.25 ML), purine molecules adsorb on the substrate producing a highly ordered
monolayer. Based on the STM results, we may conclude that purine molecules adsorb on every
other dimer via only Ge-N dative linkage forming a c(4x2) structure.

[참고문헌]
1. Young Eun Cho, Jae Yeol Maeng, and Sehun Kim, J. AM. CHEM, SOC. 2003, 125, 7514.