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Surface Alloy Formation of Nb on Cu(100)

이준희, 윤홍식, 양경득, 여인환
(연세대학교 물리학과 및 초미세표면과학연구센터)

We studied Nb growth mode on Cu(100) surface by scanning tunneling microscopy (STM) at room temperature. Nb/Cu is immiscible at room temperature and thus is an ideal system for studying surface alloy formation. Initially deposited Nb atoms are incorporated subsurface on Cu(100). After annealing, they are preferentially found at step edges and appear as bright dots surrounded by dark rings. Ordering emerges from step edges as annealed. Ordered $(\sqrt{5} \times \sqrt{5})R 26.6^\circ$ phase Nb structure is formed at $\theta < 0.2$ ML after annealing to 500°C. At higher coverage, $\theta > 0.25$, annealing leads to $p(2 \times 2)$ phase. Due to large mismatch in lattice parameters, the domain is limited to a few tens of nm². Growth kinetics of the system will be discussed.

[참고문헌]

1. J. Tersoff. Phys. Rev. Lett. **74**, 434 (1995)