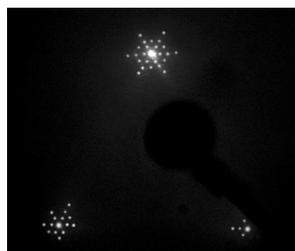


# Structure and Energetics of Silver/Copper-Alloy Films on a Rhenium(0001) Surface

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## Abstract:



schematic LEED-Pattern of  
4.4ML Ag+Cu/Re(0001)

Bimetallic films of Copper and Silver were prepared and investigated by Temperature Programmed Desorption (TPD) and Low Energy Electron Diffraction (LEED).

Submonolayer 1:1- mixed Ag+Cu films produce no superstructures in LEED but change the LEED-IV-curves of the Re-spots. When a film thickness of  $\sim 4$ ML is reached, (25x25)-LEED-patterns are appearing which are not identical with the (14x14)- superstructure of 0.8...10ML-Cu-films or with the (15x15)- superstructures of 2...5ML-Ag-films.

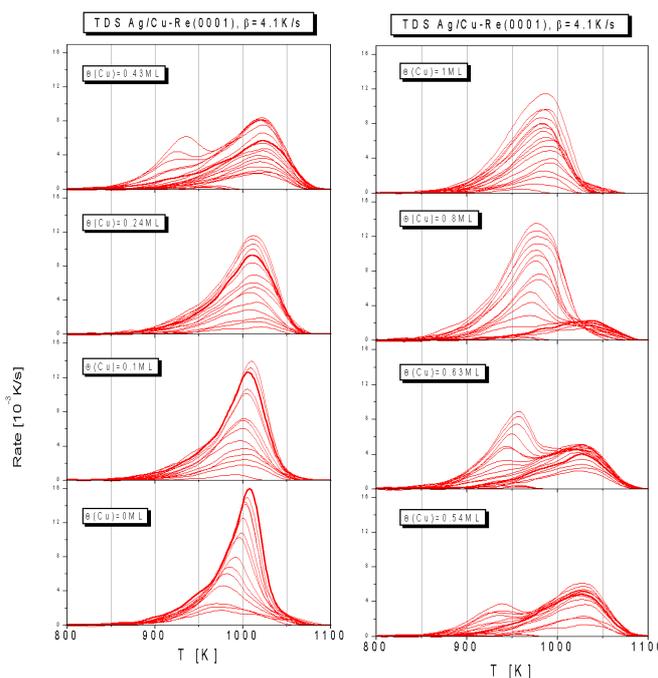
The miscibility gap of the volume-system Ag/Cu appears to be overcome by strong registry with the substrate-lattice resulting in a surface alloy of Cu and Ag.

(Ratios of radii: Cu/Re: 93.3%; Ag/Re: 105.4%; (Cu+Ag)/2Re: 99.3%; Cu/Ag: 88.5%)

Ag-TPD-spectra of the mixed films show, in contrast to Ag/Re(0001)- and Cu/Re(0001)-TPD-spectra no common leading edge. Entropic effects and attractive interactions obviously hinder the formation of a separated phase of pure Ag- (and Cu-) islands and that way the equilibrium between the 2D-gas phase and the 2D- condensed phase as well.

## Content:

- introduction and motivation
- results of the sub- Ag+Cu- bilayer Ag - TPD measurements
- results of the LEED measurements
- overview of work of other research groups in this field
- summary and future work



## Literature:

Surf. Sci. 313(1994)83

J. Vac. Sci. Technol. A 12(1994)1795

Phys. Rev. B 59(1999)13379

Ag+Cu/Ru(0001),

Ag+Cu/Ru(001),

Au+Ag/Ru(001),

Ag-TPD, MC-calculations

Ag-, Xe-TPD, PAX, ARUPS

Ag-TPD, UPS, XPS