Acta Physica Academiae Scientiarum Hungaricae, Tomus 49 (1–3), p. 235 (1980)

THE COMPOSITION OF THIN FILMS WHEN FORMED BY EVAPORATION PROCESSES UNDER HIGH VACUUM AND ULTRA HIGH VACUUM CONDITIONS

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Abstract

The influence of specimen preparation before and during an evaporation process has been investigated at room temperature for aluminium deposited on copper foils. The first series of specimen was prepared and analysed under UHV conditions. The second series was prepared under HV conditions, but analysed again under UHV conditions. For all targets ion etching with some 10^3 Å was used for surface cleaning. The evaporation and etching was carried out in a special UHV specimen preparation chamber. After the respective preparation the targets were transported over a UHV sluice lock to a second UHV chamber, where the target surfaces were analysed by SIMS method down to a depth of 600 Å. If preparation and aluminium deposition are done under HV conditions, the deposited layer becomes an aluminium oxide layer, while deposition under UHV conditions without surface cleaning forms a layer which consists of a pure Al layer with a strongly oxidised transition layer. Ion etching and Al deposition under UHV conditions forms a pure metal layer consisting of the evaporated material only.