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<th>INO Shozo</th>
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Epitaxial Growth of Metals on Rocksalt Faces
Cleaved in Vacuum

II. Orientation and Structure of Gold Particles
Formed in Ultrahigh Vacuum*

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The Research Institute for Iron, Steel and Other Metals

Abstract

The orientation and structure of gold particles formed by evaporation on rock-
salt cleaved in ultrahigh vacuum have been studied at various stages of the
nucleation and growth process. Besides four 200 and twenty-four 220 spots which
indicate the presence of the (001) orientation and (111) orientation respectively,
twenty-four abnormal 111 spots have been observed in electron diffraction patterns
taken at earlier stages of growth, and various unusual contrasts have been
observed in dark field electron micrographs using one of 111 spots. A multiply
twinned particle model is proposed by the present author, and the appearance of
the 111 spots and the dark field image contrasts can satisfactorily be explained by
this model. With increasing thickness particles with the (111) orientation and
without the multiple twinning exclusively grow up, while multiply twinned
particles and those with the (001) orientation seem to stop their growth; and
a continuous gold film with the (111) fibrous structure is formed at a thickness
of about 500Å.

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