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Initial growth mechanism of Au on SnO₂ thin film substrate by SC model

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Growth mechanism of gold film on amorphous SnO₂ substrate deposited by ion-beam assistance was investigated at various deposition rates(R). The growth evolution processes in the case of deposition rate of 0.5 Å/s are as follows; n-increase in a range of ~6.8 Å thickness, n-increase and 3-D in 7.0~8.4 Å thickness, 3-D and coalescence growth in 8.9~17.3 Å range, 3-D and increased coalescence growth in 17.8~26.7 Å range, and 3-D + coalescence + columnar structure growth in range of 26.7~48.0 Å. The island number increased until 8.4 Å thickness and then decreased, but the size of island was constant until 6.8 Å thickness and then increased. The growth evolution was clearly explained by a proposed model. In the case of deposition rate 1.0 Å/s, 3-D and coalescence growth increased, the island number decreased but its size increased. The tendency was changed from high possibility of coalescence to formation of columnar structure with increasing deposition rate. The initial growth characteristics showed to be continued after growth of 100~200 Å thickness from investigation of conductance by tunneling on glass substrates.