better understanding of the kinetics of the interface. For example, thin, polycrystalline metallic films are applied to numerous devices to prevent corrosion and to provide conducting paths. A smooth film of uniform thickness is desirable for most purposes. But, since the kinetics of deposition are usually anisotropic, different crystallites in the film will thicken at different rates and produce a coarse and irregular structure. From the discussion above, we see that the conditions can be modified in several ways to reduce the kinetic anisotropy. (i) The temperature can be increased to exceed the roughening point of all faces. (ii) The driving force can be increased (Fig. 2a). (iii) Impurities can be added to the system to facilitate nucleation on close-packed faces. In practice, impurities are often used for this purpose, but a better understanding of the exact role of the impurity may facilitate the search for the most effective agent.

The Ising model is well suited to a study of interface kinetics. It is probably the simplest model that can exhibit the basic phenomena of surface roughening, impurity segregation, and lattice defects. It is equivalent to the Kossel model discussed by Volmer (*10*) and Stranski (*11*) many years ago. However, only recently has the computer technology been developed that has enabled us to evaluate its properties in some detail. Improvements in the model are needed, in order to treat other important aspects of crystal growth. Models that allow continuous atomic coordinates can exhibit the formation of lattice defects during the crystal growth process. Also, an accurate treatment of the crystal-melt interface kinetics requires a more detailed model. Thus, although considerable progress has been achieved, a number of interesting problems remain to be solved.

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