Model for crystallization kinetics: Deviations from Kolmogorov-Johnson-Mehl-Avrami kinetics

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Abstract-

We propose a simple and versatile model to understand the deviations from the well-known Kolmogorov-Johnson-Mehl-Avrami kinetics theory found in metal recrystallization and amorphous semiconductor crystallization. We analyze the kinetics of the transformation and the grain-size distribution of the product material, finding a good overall agreement between our model and available experimental data. The information so obtained could help to relate the mentioned experimental deviations due to preexisting anisotropy along some regions, to a certain degree of crystallinity of the amorphous phases during deposition, or more generally, to impurities or roughness of the substrate. (C) 1999 American Institute of Physics. [S0003-6951(99)02641-8].

Index Terms- recrystallization, simulation, nucleation, growth, metals

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