

Diffusion at Nanoscale: An *in-situ* real-time TEM study

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Abstract

The detailed nanoscale dynamics at various surfaces and interfaces, for example, diffusions, are crucial for fundamental understanding and device applications. *In-situ* (S)TEM is becoming a popular technique to exhibit live performance, functional mechanisms, diffusions and reactions for complicated and nanoscale materials under various conditions, such as annealing, biasing, e-beam irradiation and strain. This technique opens a new era to observe real-time microstructural evolution in the materials and correlate it with their mechanical and electrical properties. This lecture will briefly discuss various in-situ results of different materials starting from thin films to nanomaterials/carbon nanotubes and challenges in preparing electron-transparent samples for such in-situ experiments.