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In situ Electron Microscopy, Kinetics of Materials, Nanowires, Silicides/Germanides, Crystal Growth of IV and III-V Materials

We are “Cross-disciplinary Kinetics Research Lab” of the Electrophysics Department at NCTU. Our primary research interests include : **(a)** in situ and high performance transmission electron microscopy : we have developed in situ techniques in transmission electron microscopes to perform reactions of materials and observe them at atomic scale. It allows us to analyze the kinetics of the reactions and go deep into the fundamental science. We are also interested in characterization of the atomic structures, chemistry, and interface science of 1D and 2D materials. **(b)** phase transformation in materials: we investigate the formation of silicides and germanides in low dimensional nanostructures such as nanowires, and develop models for such reactions which benefits to precise control of forming such nanostructures for applications. **(c)** the growth of low dimensional nanostructures. In the past few years, our group has achieved some milestones toward our ultimate goal including interpretation of the major effect of silicide phases forming in nanowires (Figure 1) and the integration of self assembled nanowires with silicides inside for further applications. (Figure 2).

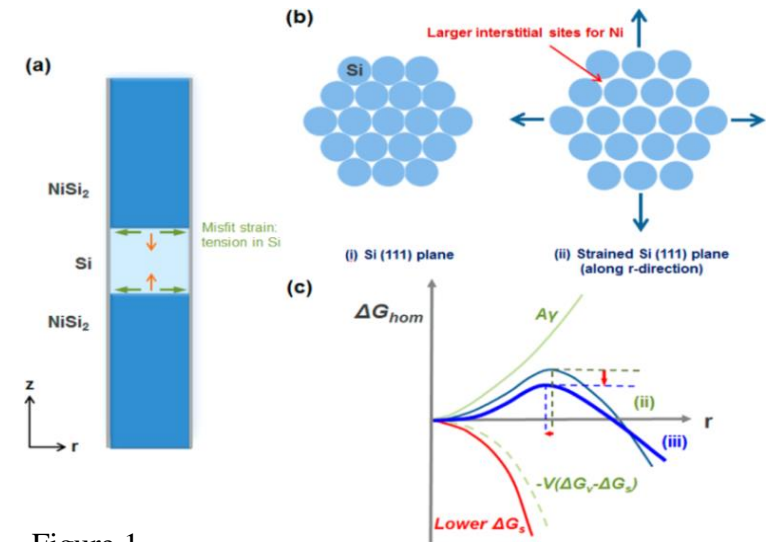


Figure 1

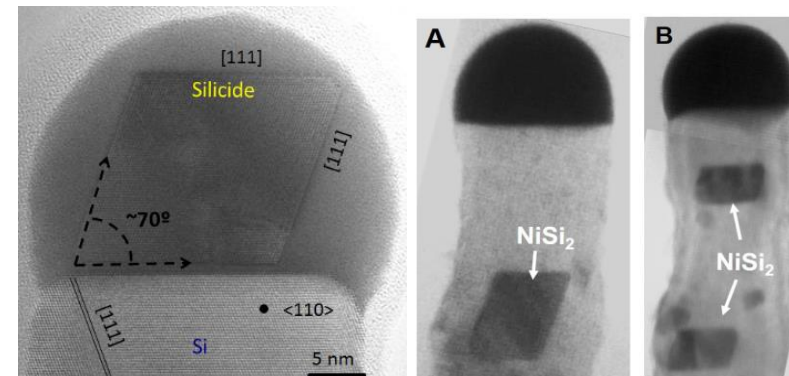


Figure 2