

ABSTRACT

Growth Behavior and Kinetics of Hydrothermal Crystal Growth in Potassium Tantalate
Niobate Particles

Tiffany Ly

Nanoparticle synthesis is capable of producing particles with any combination of structure, chemistry, size, shape, and surface. All of the different combinations of these physical properties can produce nanoparticles with almost countless materials properties suited for many applications. Given this interest in using nanoparticles in so many different fields, including electronics, catalysis, and biomedicine, there is also immense interest in understanding the correlation between the physical property of nanoparticles and their resulting functional properties. If any of these properties are phase-, composition-, size-, shape-, or surface-dependent, then methods to synthesis nanoparticles with these traits need to be developed. Therefore, understanding how thermodynamic and kinetic conditions influence nanoparticle growth behavior is essential for these studies. In this dissertation, this was done primarily through studying the growth behavior of oxide nanoparticles in hydrothermal syntheses.