

Nanostructure Control of Interface and Microstructural Design

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The design of microstructure in materials, ranging from ultrafine, moderately sized, duplex to single crystalline, via grain growth control has long been a challenging subject to materials scientists. According to recent investigations,¹⁻⁴ grain growth behavior is largely governed by the interface structure in the nanoscale. When the interface is faceted, abnormal grain growth can occur or grain growth can be suppressed. For rough interfaces, on the other hand, normal grain growth occurs. Taking BaTiO₃ and SrTiO₃ as model systems the possibilities of interface structure control and related development of various microstructures are demonstrated. Basic principles of microstructure developments in polycrystals are also presented and discussed.

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