

## Effect of Al<sub>2</sub>O<sub>3</sub> on Abnormal Grain Growth in Barium Titanate.

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### Abstract

When sintering BaTiO<sub>3</sub>, abnormal grain growth must usually be avoided, as it has negative effects on the dielectrical and mechanical properties of the ceramic. The effect of donor dopants upon abnormal grain growth in BaTiO<sub>3</sub> has been studied extensively. However, relatively little research has been carried out on the effect of acceptor dopants on abnormal grain growth. The authors will present research carried out on the effect of additions of Al<sub>2</sub>O<sub>3</sub> on abnormal grain growth in BaTiO<sub>3</sub> with a slight Ti-excess. Samples were sintered in air at 1200°C, 1250°C, 1300°C, and 1350°C. Additions of Al<sub>2</sub>O<sub>3</sub> initially increase the number density of abnormal grains, with further additions causing a reduction in number density. The reduction in number density of abnormal grains is more pronounced for samples sintered below 1300°C. The results will be explained by considering the effect of Al<sub>2</sub>O<sub>3</sub> addition on the TiO<sub>2</sub> content of grain boundaries.