has been observed by tilting experiments. Further TEM investigations within the composition range given above are in progress. Findings will be correlated with X-ray and neutron diffraction experiments.

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Keywords: diffraction; piezoelectric ceramics; TEM

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Exaggerated Grain Growth Triggered by Intrinsic Defects; A TEM Study. Stefan Lauterbach[a], Hans-Joachim Kleebe[a]. [a]*Institute for Applied Geosciences, Geomaterial Science, Technische Universität Darmstadt, Darmstadt, Germany.*
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Three different oxides, namely bixbyite, $(Mn,Fe)_2O_3$, boron suboxide B_6O and spinel, $MgAl_2O_4$, were investigated by transmission electron microscopy in order to determine the origin of exaggerated grain growth observed in each of these systems.
Bixbyite revealed the presence of planar defects that were identified as thin braunite lamellae present as a 3D-network within the host crystal.
In boron suboxide, doped with excess silica, numerous enlarged grains were observed within the otherwise rather fine-grained matrix. Those grains contained, similar to bixbyite, planar defects enriched in Si.
Spinel polycrystals, doped with LiF, also showed pronounced grain growth at intermediate sintering temperatures. The grains that revealed considerable grain growth contained F (and Li), which as a consequence causes the formation of oxygen vacancies.
Based on the above examples, a model is presented that explains the observed exaggerated growth of individual grains by the presence of intrinsic defects within the host crystal. One example will be shown that allows the utilization of such a correlation to tailor the overall microstructure of polycrystalline ceramics.

Keywords: grain growth; defects; transmission electron microscopy

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Investigation of Precipitation of β-Cr_2N in Duplex Stainless Steel SAF 3207HD Using Transmission Electron Microscopy (TEM). Ping Liu. *Department of physical metallurgy, R and D Centre, Sandvik Materials Technology, 811 81 Sandviken Sweden.*
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The critical pitting temperature (CPT) of welded SAF 3207 HD was found to be lower than what was expected based on the pitting resistance equivalent (PRE). So is the welded SAF 3207 HD. In order to understand and eventually find a way to circumvent this problem a detailed microstructural study was carried out using high resolution field emission scanning electron microscopy (SEM) and analytical transmission electron microscopy (TEM).

β-Cr_2N ($P\bar{3}1m$ (No.162) a=4.8113 and c=4.4841 Å) was found in 1200°C/5 min with cooling rate of 339 °C/s sample. No intermetallic phase such σ-phase ($P4_2/mnm$ (136) a=8.790 and c=4.544 Å) or β-Cr_2N was observed in sample heat treated at 1120°C/15 min-1000°C/16 min with cooling rate of 25 °C/s. σ-phase was observed in sample heat treated at 1120°C/15 min-700°C/32min. It was found that the size and volume fraction of β-Cr_2N was a function of solution temperature and cooling rate after solution treatment.

The diffusion of nitrogen is the dominant fact which controls the precipitation of β-Cr_2N. This in term is interpreted as solubility and diffusivity of N in ferrite.

As a result of this investigation it is recommended that in order to keep duplex phase structure and to avoid the precipitation either β-Cr_2N or σ-phase, low solution temperature (1000 °C-1100 °C) and slow cooling after solution treatment (or welding) is recommended down to temperature above which formation σ-phase would take place.

Key words: TEM; stainless steel; intermetallic phase