

SEM Investigation of the Microstructure of Oxygen-Deficient $\text{Ca}_2\text{FeGaO}_{6-\delta}$.

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Abstract:

This study presents a detailed investigation of the microstructure of the oxygen-deficient perovskite material $\text{Ca}_2\text{FeGaO}_{6-\delta}$ using Scanning Electron Microscopy (SEM). The material exhibits significant porosity and irregular grain morphology, with variations in grain size and growth. Unlike conventional perovskite structures, $\text{Ca}_2\text{FeGaO}_{6-\delta}$ shows non-uniform grain development, which can be attributed to the presence of oxygen vacancies (δ). SEM analysis reveals that the irregularities in grain size and shape, coupled with the porous nature of the material, are likely to influence its functional properties. These findings provide valuable insights into the structural features of $\text{Ca}_2\text{FeGaO}_{6-\delta}$, offering a foundation for understanding its potential applications in catalysis, sensors, and other technologies. The study highlights the critical role of microstructural characteristics in determining the material's performance.