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Texture of coesite in diaplectic glass from Ries suevites

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In moderately shocked (stages II-III) suevite rocks, quartz grains are usually completely transformed into diaplectic glass [e.g., 1]. It is widely known that the glass can also contain traces of coesite. The coesite occurs as aligned strings or polycrystalline aggregates, and is often associated with secondary quartz [e.g., 2, 3, 4].

In order to understand how and why these textures form, we investigated moderately shocked suevites and unshocked gneisses from the Ries crater by optical microscopy and Raman spectroscopy.

Unshocked quartz grains are characterized by numerous subgrain boundaries, which are decorated by abundant fluid inclusions. These surface defects may play an important role in the formation of high-pressure polymorphs and the subsequent nucleation of secondary phases within diaplectic glass. Further investigations are necessary to validate this hypothesis.

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