

A relationship between d_{104} value and composition in the calcite-disordered dolomite solid-solution series

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ABSTRACT

X-ray diffraction has been widely used in analyzing Ca-Mg carbonates. Compositions of biogenic and inorganic (Ca,Mg)CO₃ crystals are often calculated by comparing their d_{104} values with published empirical curves. However, previous studies suggested that these curves do not apply to very high-Mg calcite and disordered dolomite. Based on synthesized high-Mg calcite and disordered dolomite, a new empirical curve between values of magnesian calcite d_{104} and MgCO₃ content in the calcite-disordered dolomite solid-solution series is constructed. This new curve is consistent with the significant cell parameter changes accompanying the Mg-Ca cation disorder in dolomite, and it can help the characterization of the MgCO₃ content of both natural and synthetic magnesian calcite and disordered dolomite, especially for the mineral mixtures that are not suitable for other analysis methods.

Keywords: High-magnesian calcite, d_{104} , calcite, disordered dolomite, solid solution, Mg-Ca ordering in dolomite