

Dawsonite: An inclusion mineral in quartz from the Tin Mountain pegmatite, Black Hills, South Dakota

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ABSTRACT

Dawsonite — $\text{NaAl}(\text{CO}_3)(\text{OH})_2$ —was identified in primary fluid inclusions in quartz from the Li-rich Tin Mountain pegmatite, Black Hills, South Dakota, by petrography, SEM-EDS analysis, and Raman spectroscopy. This is the first report of dawsonite as an inclusion mineral in a pegmatite. The presence of dawsonite in the inclusions is evidence for the existence of carbonate ions in the complex pegmatite melt and/or exsolved magmatic fluid. The lack of dawsonite as a macroscopic mineral is attributed to its high solubility in the late pegmatite fluids and to the small fraction of carbonate ions in the melt. However, its common occurrence, along with other carbonate and borate minerals in fluid inclusions, suggests that carbonate and borate complexes play an important role in petrogenesis of pegmatites.