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GSA Connects 2021 in Portland, Oregon

Paper No. 188-16

Presentation Time: 2:30 PM-6:30 PM

A CALCITE INVESTIGATION ON THE GREAT BANK OF GUIZHOU IN THE NANPANJIANG BASIN, SOUTH CHINA

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The Great Bank of Guizhou (GBG), located in the Nanpanjiang Basin of south China, is a 2.5 km thick isolated platform of Triassic carbonate. Diagenetic features of samples in the GBG were investigated to interpret geologic history of dolomitized rocks and their relationship with calcite. Through multiple sections and in all carbonate depositional facies, calcite is nearly ubiquitous, represented as various sizes and crystal habits. Methods of investigation included petrographic analysis to construct a paragenetic sequence, fluid-inclusion microthermometry of calcites, and stable isotope analysis of calcite and dolomite.

The host rocks have multiple generations of dolomite with varying textures. Dolomite was followed by fracturing, minor pyrite and other minerals, calcite cementation, and stylolitization. Multiple generations of calcite occur as isopachous calcite marine cements, two generations of pore-filling cement, and fracture filling cement. Fracture and pore-filling calcite crystals range from a few microns to over a centimeter wide and are mostly anhedral. Fracture and pore-filling calcite occur as either heavily twinned or untwinned/lightly twinned crystals, which represent various degrees of deformation. Previous fluid inclusion data for the host dolomites show entrapment of a brine between 110°C and 180°C with salinities up to 16 wt.%. The observed fluid-inclusion assemblages (FIAs) included both primary and secondary aqueous assemblages. Primary FIAs in calcite were rare but occur as three-dimensional arrays of all-liquid inclusions, indicating that at least some later calcite formed ≤50°C. Abundant secondary FIAs indicate that entrapment of a low salinity water occurred over a large range of temperatures between about 50°C and 121°C. Temperature and salinity data from calcite are lower than for late-stage dolomite, indicating a trend toward lower temperature and salinity over time.

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[T168. Undergraduate Research Posters by 2YC and 4YCU Geoscience Students \(Posters\)](#)

Tuesday, 12 October 2021: 2:30 PM-6:30 PM

Exhibit Hall A (Oregon Convention Center)

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