

Paper Number: 2319

The discovery of fluid inclusion in moissanite in serpentinite from the southern Dabie Mountain (Anhui area), PR China

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Since natural moissanite was discovered in serpentinite from Dongjiashan, a series of moissanite discoveries in serpentinite has occurred from adjacent areas, such as Tingziling, Gushan and Huxing. Most moissanite is 0.02–0.05 mm × 0.04–0.08 mm, with a few up to 0.1–0.17 mm. With main peak values of 788–789 cm⁻¹, secondary peak values of 968–972 cm⁻¹ and weak peak values of 767–784 cm⁻¹, the Raman spectrum peak of moissanite was stable. X-ray structural analysis indicated that moissanite was trigonal or hexagonal crystal system. There are two types, a-6H and a-15R respectively. The crystals are uniaxial (+) and biaxial (+). For biaxial, the axial angle (2V) is 37°. With obvious biaxiality, most of crystals were biaxial. In addition to natural silica inclusions, two-phase liquid–vapour inclusions have also been found in the moissanite. These inclusions are rounded, elliptical, trilateral or tabular. Most of the inclusion are 1–2 μm in length, although a few are 5–10 μm. The distribution of inclusions shows they were caught during crystal growth, indicating that these inclusions were primary. Laser Raman spectroscopy was carried out at the School of Earth and Space Sciences, University of Science and Technology of China. The analyses show that the composition of inclusions is CH₄, C₂H₆, C₃H₈, C₆H₆ and H₂O. The peak values of 3400–3479 indicated that H₂O was the uncommitted water molecular phase in moissanite. With the increasing number of similar reports, this discovery has the same significance with the discovery of microfluid inclusions in diamond from Botswana and Zaire. These inclusions represent aliquots of the mantle fluid and magmatic melt that were captured in the moissanite during formation. This study provides a powerful basis for studying the petrogenesis of ultrabasic rocks in the Dabie Mountain Region.

Acknowledgement: This work is funded partially by the National Natural Science Foundation of China (40542012, 40672145), as a scientific research project of the Department of Land and Resources of Anhui Province and as a scientific research project of the Bureau of Geology and Mineral Exploration of Anhui Province.

