Ore-forming fluids in the Maoping and Piaotang W-Sn deposits (Jiangxi, China)

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The Jiangxi province is currently the world’s leading tungsten producer thanks to numerous vein-type W-Sn deposits developed around peraluminous granitic intrusions emplaced during the Early Yanshanian event (150 to 160 Ma). Among the many aspects of the ore-formation, the respective implications of magmatic vs non-magmatic fluids deposits is still controversial.

A fluid inclusion study in quartz, cassiterite, wolframite, topaz and fluorite from Maoping and Piaotang was carried out to investigate the nature of hydrothermal fluids from pre- to post-ore events [1]. Primary and pseudo-secondary fluid inclusions in all investigated minerals and in both deposits show a liquid phase vapor phase at 25°C. The vapor phase contains trace amounts of volatiles (CO2, CH4 and N2) as revealed by Raman spectroscopy. Microthermometry shows that homogenization of the fluid inclusions to liquid phase occurs between 136° and 349 °C and ice melting temperatures are between -14.2° and 0.0 °C, implying salinities ranging from 0.0 and to 12.6 wt.% NaCl equiv. Fluid inclusions temperature-corrected δ18O values are between -3.6 and 9.1‰ and δD values are between -76.5 to -55.2‰. All data point to a mixing between magmatic and external fluids during the main ore stage.