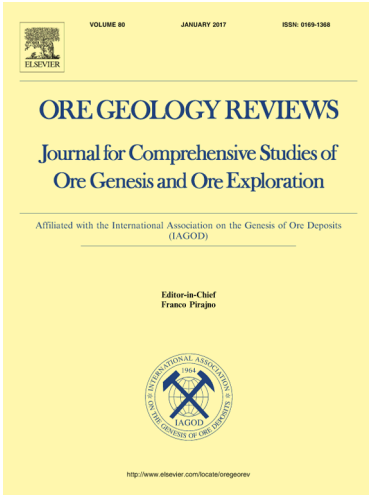

The Ordovician igneous rocks with high Sr/Y at the Tongshan porphyry copper deposit, satellite of the Duobaoshan deposit, and their metallogenic role

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The Ordovician igneous rocks with high Sr/Y at the Tongshan porphyry copper deposit, satellite of the Duobaoshan deposit, and their metallogenic role

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Abstract: A strong link between high Sr/Y arc magmas and porphyry Cu–Mo–Au deposits has been recognized in recent years. The Tongshan and Duobaoshan deposits are representative large Cu–Mo–Au deposits in NE China. We report LA–ICP–MS zircon U–Pb crystallization age of 471.5±1.3 Ma for Tongshan ore-related granitoid. Re–Os isotopic analyses of the two chalcopyrite samples from Tongshan deposit show a model age range of 470.2 Ma to 477.1 Ma. The Duobaoshan and Tongshan ore-related granitoids show higher Sr/Y and La/Yb ratios. The $\delta^{34}S$ values of sulphides from the Duobaoshan and Tongshan deposits vary from -2.3‰ to 0.0‰, belonging to a magmatic-hydrothermal system. The Pb isotopic ratios of the sulfides from the Duobaoshan and Tongshan deposit range from 17.201 to 18.453 for $^{206}Pb/^{204}Pb$, 15.445 to 15.551 for $^{207}Pb/^{204}Pb$, and 36.974 to 37.999 for $^{208}Pb/^{204}Pb$, indicating the addition of lower crustal material. The Duobaoshan and Tongshan granitoids were formed in a subduction-related continental arc setting, produced by partial melting of juvenile hydrous basalts underplating the deep continental crust during the Ordovician.

Key words: high Sr/Y; arc magma; porphyry deposit; Cu–Mo–Au