

Geology and age of the Jinchanggouliang gold deposit in North China

Lingchao Mo* and Fulin Liu

Geology Institute of Chinese Academy of Geological Sciences, Beijing, China, *e-mail,
molc1994@gmail.com

Jinchanggouliang is a large gold deposit in the northern margin of the North China Craton, and it contains 7 Mt of resources averaging 10 g/t Au. It is one of a number of gold deposits that are centred around the Xiduimiangu intrusion, a granodiorite stock with a reported U-Pb age of 128 Ma. The Jinchanggouliang deposit is hosted by Archean metamorphic rocks, comprising an amphibolite facies gneiss that formed at ~2.5 Ga with peak metamorphic ages at ~2.2 and ~1.8 Ga. Strictly fault-controlled gold-quartz veins and altered wallrock are characterized by a network of mineralized conjugate faults that can be distinguished into two orientations: NW-SE veins that dip NE and N-S veins that are near vertical. Both conjugate faults are steeply dipping, anastomosing, branching, generally less than a few meters wide, and consist of variety of fault rocks which include cataclasite, fault breccia, clay gouge, and sulfide gouge. Native gold and electrum are hosted by the gold-quartz veins, grains are 2-300 μm , and fineness is 766-915 ‰. Gold-bearing sulfide minerals include pyrite, chalcopyrite, galena, and sphalerite. One gold-quartz vein sample in which patterns are revealed by cathodoluminescence (CL) studies indicates significant movement and the growth of the veins during the ore-forming process. Four epochs of quartz were recognized through crosscutting relations, CL images, and shape and paragenetic associations of quartz grains. A minimum age for ore formation has been obtained by a zircon U-Pb (128.5 \pm 1.3 Ma) date on andesite that overlies the ore veins and gneissic host rocks. This younger age limit for gold deposition is roughly the same as obtained by a U-Pb age of 131.7 \pm 1.1 Ma from a trachyandesite dike that cuts the gold-bearing veins. The deposit is probably Early Cretaceous in age and formed in association with magmatism and metamorphism.