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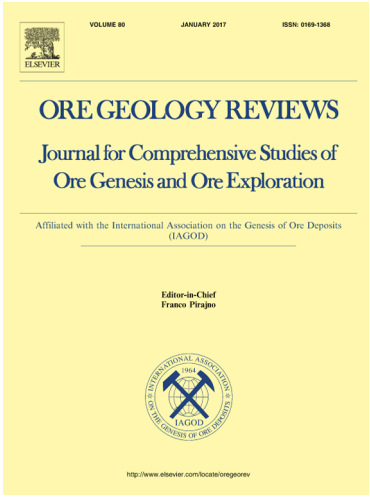

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The Berezovsk Giant Intrusion-Related Gold Quartz deposit, Urals, Russia: Evidence for Multiple Magmatic and Metamorphic Fluid Reservoirs

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Dedicated to the memory of Prof. V.N. Sazonov, a great Russian scientist in the field of gold-bearing altered rocks of the Urals.

ABSTRACT

The Berezovsk gold deposit in the Middle Urals has been mined for 270 years. Its endowment (past production and gold reserves) is estimated to be 450 t of gold. The deposit is located in the greenschist metamorphosed Silurian volcanogenic-sedimentary rocks intruded by granitoid dykes to the north-east of Late Carboniferous Shartash granite massif. Mineralisation is represented by sulphide-quartz veins in the granitoid dykes ("ladder" veins) and in the host rocks ("krassyk" veins) formed in the following four stages: ankerite-quartz, quartz-pyrite, gold-polymetallic and carbonate. Ore veins are accompanied by halos of gumbeite (quartz + orthoclase + carbonate), beresite (quartz + sericite + ankerite + pyrite) and listvenite (quartz + Fe-Mg carbonate + fuchsite +pyrite). The veins mainly consist of quartz with sulphide minerals (commonly 3-5 vol. %). About 180 minerals have been identified in ores, but the most abundant minerals are quartz, calcite, ankerite, pyrite, galena, tennantite, chalcopyrite, aikinite, native gold, and sphalerite. Native gold was deposited during quartz-pyrite (Au I) and gold-polymetallic (Au II) stages. Fineness of gold ranges from 863 to 984 and from 723 to 848 for Au I and Au II, respectively. The mineral and metal zoning was identified relative to the roof of the Shartash granite massif. The fluid inclusion study revealed that the gold mineralisation at the Berezovsk deposit was formed at 300 to 230°C and 0.3 to 2.3