

5.0.P20**Gold mineralization in the Gezhen shear zone and its dynamic deformation simulating experiments**YUANGEN YANG, ZHISHENG JIN AND XUEYI WU

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Erjia gold deposit located in Hainan Province, China was closely related with Gezhen shear zone activity. Tectono-geochemical method had been applied to study the relations of Gezhen shear zone activity and gold ore-forming process. Rock textures were greatly altered when migmatite deformed to mylonite and ultramylonite in Gezhen shear zone, accompanied by loss in feldspar and mica contents and elevation in quartz and sericite contents. Rock chemical components were also shifted with increase of SiO₂, Fe₂O₃, P₂O₅ and loss of Al₂O₃, FeO, TiO₂ and K₂O, accompanied by tectono-fluid activity. Some deformation mechanisms could be distinguished in Gezhen shear zone deforming process, in which the resilience mechanism could be attributing most for gold enrichment in mylonites.

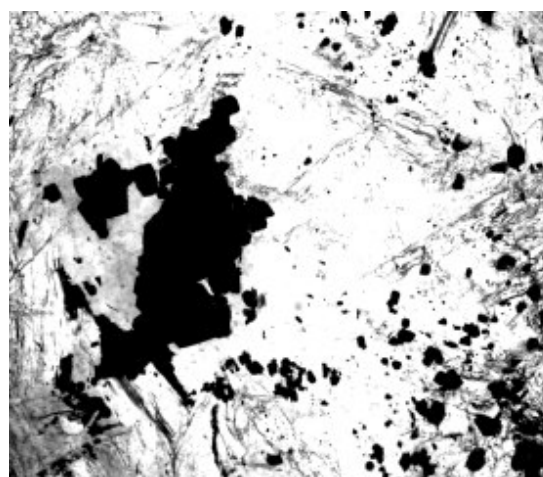
Paleogeometer from grain sizes of dynamic recrystallized quartz gave evidence that Au enrichment in mylonites had a good positive relation with deformation differential pressure; the correlation coefficient was as high as to +0.5928 with a confidence level of 5% by t test. Trace element abundances in quartz formed in different tectono-fluid activity stages varied greatly, ore forming elements Au, Ag, Cu, Pb and Zn were found higher in the brittle-ductile stage compared with brittle and ductile stages.

Chemical compounds of fluid inclusions in quartz also varied in different tectono-fluid activity stages. Higher fluid activity was found in ductile-brittle stage with higher gaseous constituents, but with lower ore forming elements and anion constituents. This indicated a close relation for tectono-fluid activity and gold enrichment.

Two kinds of tectono-geochemical simulating experiments were carried out. Massive solid sample tests clarified that dynamic deformation not only altered the texture of massive rocks, but formed micro-shear zone, cataclastic grain flow, and with apparent fluid activity accompanied. This process closely connected with pressure dissolution during deformation. Three developing stages for pressure dissolution, that were cataclastic, dissolved-precipitation and viscous flow can be observed. Powder molding sample tests showed that natural gold grains universally precipitated after tests, they usually occupied in the fissures formed during deformation. This agreed with the possibility of deformation offering precipitation spaces for gold. Good positive relations can be found for Au contents with Fe and Si contents in the newborn gold grains. This indicated a close relation of Au precipitating from Au-Cl complexes with Si and Fe in fluids. Si and Fe may play a key role in this process.

5.0.P21**Platinum and palladium bearing mafic and ultramafic rocks in Bababudan-nallur shear zone, Western Dharwars, India**P.V. SUNDER RAJU¹ AND T.S. MADDOOM HUSSAIN¹Geochemistry group, National Geophysical Research Institute, INDIA (pvsraju@ngri.res.in)

Mafic-ultramafic (MUMF) suite rocks of Archaean age occur as discontinuous bodies near Bababudan-Nallur shear zone in Western Dharwar Craton of South India. Studies were carried out on these MUMF to know the nature, chemical composition and probable PGE mineralisation in these rocks. These MUMF, which occur as enclaves in gneisses and range in size from tens of meters up to four km, trending NNW. The MUMF pods consist of meta-peridotite, tremolite-actinolite schists, serpentinites amphibolites and metabasalts with minor gabbro dykes and glimmerite veins. Petrological studies reveal typical nodular and ocelli structures occurring in talc-serpentine rocks. Talc-serpentine and tremolite-actinolite schists are peppered with opaque dust mostly at the grain boundaries Fig 1 of the constituent minerals as well as in the serpentine rich ground mass. The rocks have mineral assemblage of serpentine, antigorite, talc, tremolite, actinolite, hornblende, chromite, magnetite, Ilmenite, titanomagnetite and have undergone greenschist to amphibolite facies metamorphism. EPMA studies carried out on the amphibole grains show presence of rounded-subrounded Cr grains probably containing Pt. Chemical compositions show MgO(22-40%), total iron (8.34-10%) Ni and Cr (~3500,2600 ppm), Au, Pt & Pd (100, 1420, 1000 respectively). Shear-zone near BN and MUMF seems to be promising targets for PGE mineralisation.

**References**

- [1] A.J.Naldrett (1976) *Economic Geology* **71**, 1131-1158.
- [2] Raghunandan (1991) *JGSI*, **38**, 6.