# Evolution of upper mantle in Southern Sanandaj – Sirjan zone of Iran

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In the Southern Sanandaj – Sirjan zone (Iran), there are several ultramafic complexes such as Kuhshah, Soghan and Abdasht. They have many evidences for belonging to the upper mantle and contain dunite, harzburgite and chromitite that in some parts, have been invaded by pyroxenitic intrusions.They show some evidences in various scales for evolution of upper mantle in this part of Iran.In the field, there are many pyroxenite veins and dykes that have been cut ultramafic sections and implies that upper mantle in this area have partially melted and then, resulting melts, have perculated in the other parts of the complexes and impregnated them. In microscopic scale, existence of second generation of orthopyroxene, clinopyroxene, olivine and euhedral chromespinels indicate strong perculation and melt/rock interaction in the upper mantle of the area. First generation minerals are large elongated and deform grains, while second ones have crystallized as small interstitial grains without any deformation. From mineral chemistry point of view, there are also two generation of minerals with different chemical composition. For example, first generation orthopyroxenes (opx1) rich in compatible and depleted in incompatible elements relative to second generation ones, (NiO in Opx1=0.16 w% and NiO in Opx2=0.07 w%). In clinopyroxenes and olivines, there are similar properties too. Geochemical data on whole rocks indicate harzburgites are depleted mantle rocks that have partially melted and then invaded and impregnated by silicate ascending melts. REE patterns of these harzburgites show depletion relative to primitive mantle, but LREE enrichments relative to MREE are evident. This feature can be produced by entrance of more incompatible REE(LREE) from melts to the harzburgites.

All of these evidenses indicate upper mantle in Sanandaj-Sirjan zone, have been affected by partial melting and melt/rock interaction. So there is strong heterogenity in various scales in this part. The ultramafic complexes of Sanandaj-Sirjan have ascent and empleced in the crust tectonically, and textural features show reequilibriation in crustal conditions .

## References

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# Geology, mineralogy, and genesis of the Iwami-Ginzan silver mine, Japan

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The Iwami-ginzan silver mine produced an enormous amount of silver following its discovery in 1309, and thus played a very important role as a major silver producing field, not only in Japan, but also at a global scale. The Iwami-ginzan silver deposit contains two types of ore bodies named the Fukuishi and Eikyu deposits: the former is disseminated type, and the latter vein-type. They are related to the dacite intrusion generated during the Pleistocene epoch of the Quaternary (Sakota *et al*. 2000).

The ore minerals of the Eikyu deposit are native silver, argentite, electrum, matildite, polybasite, stromeyerite, silver-bearing tetrahedrite, aikinite, Bi-bearing polybasite, wittichenite, tetrahedrite-tennantite, enargite, chalcopyrite, chalcocite, galena, sphalerite, and pyrite. The genetic temperature may be about 200°C. The disseminated Fukuishi deposit contained not only native silver, argentite and hematite but also jalpaite, mackinstryite, pearceite, stromeyerite, and chlorargyrite. The genetic temperature of the Fukuishi deposit might be about 100°C.

There is a significant gravity anomaly in the Iwami-ginzan area, indicating existence of a cauldron, and the Iwami-ginzan is situated at the rim of the cauldron. During the Neogene, hydrothermal solutions are considered to have repeatedly infiltrated the faults and fractures in and around the cauldron. The hydrothermal solutions which produced the Iwami-ginzan silver mine also passed through these pre-existing faults and fractures. The very high ore grades in the Iwami-ginzan silver mine may have been caused by remobilization of earlier mineralization, and hence are the product of multiple episodes of ore genesis.

## References

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