Garnet amphibolite found in Baikouquan ophiolitic mélange: A clue to a HP metamorphic belt in Junggar, Xinjiang

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Several huge ophiolite mélanges occur in western Junggar [1-2]. Our studying Baikouquan ophiolite mélange locates close to Keramay city (Xinjiang, NW China). The mafic rocks in this ophiolite mélange were demonstrated to be come from the upper mantle from depth of ~94km [2]. Spinel lherzolite in Baikouquan- Baijiangtan ophiolite mélange was exhumated from deep mantle together with the subducted crust materials.

Here we report the first discovery of garnet amphibolite in the Baikouquan ophiolite mélange. The discovered garnet amphibolite, coexisting with amphibolite and greenschist, mainly consists of amphibole and zoisite + Na-rich plagioclase assemblage with minor amounts of garnet, ilmenite, albite, epidote, chlorite, titanite, augite, rutile, apatite, and quartz. Garnet usually contains abundant apatite, rutile, and zircon inclusions. Petrographic observations provided in this paper demonstrate that the mineral assemblage formed during the early metamorphic stage (probably in eclogite phase) is garnet – clinopyroxene (possibly from omphacite) – rutile – apatite – zircon. This discovery indicates that eclogite was formed during the subduction, and means that Baikouquan ophiolite mélange together with this reported garnet amphibolite as well as the Tangbale blueschist in western Junggar represent a HP metamorphic belt similar as ion other regions of central Asia [4-6].

[1] Xu X *et al.* (2006) *Geology in China* **33**, 470-475. [2] Zhu YF & Xu X (2007) *Acta Petrologica Sinica* **23**, 1075-1086. [3] Zhang LF *et al.* (2002) *Am. Miner.* **87**, 861-866. [4] Zhu YF & Ogasawara Y (2002) *Intern. Geol. Rev.* **44**, 831-836. [5] Zhu YF & Ogasawara Y (2002) *Geology* **30**, 947-950. [6] Zhu YF (2003) *Lithos* **68**, 115-119. [7] Zhu YF & Xu X (2006) *Acta Petrologica Sinica* **22**, 2833-2842.

Influence of historical land use on the distributions of soil trace elements in Maricopa County, AZ

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The distribution of trace elements in urban areas depends on geologic background, human inputs, and the subtleties of changes in land use over time. In the arid southwestern US, urbanization occurs on land that was previously used for agriculture, as well as land that was, until recently, pristine desert. In this study, surface soil samples (top 10 cm) collected at 200 locations across Maricopa County, Arizona, were analyzed by ICP-MS. Results for Pb, Cd, Ag and Cu show strong correlations with urbanization, while Ni, V, U and Sr may reflect changes in background geology. Arsenic data may reveal the long-term effects of irrigation with As-rich water from the Verde River. When comparing As and Fe, older agricultural sites differ more from desert sites than newer sites, suggesting a shift in the source of As with time. Data for Pb were regressed against historical traffic data collected and distilled for each sampling location through GIS analysis. There is a somewhat stronger correlation between soil Pb distribution patterns and traffic data from 1972 than with traffic data from 2004, suggesting an origin from recent human history. Patterns for other metals that suggest urban influences (Ag, Cd, Cu) may include point source contributions.