

Potassic amphibole from the upper mantle of NE China

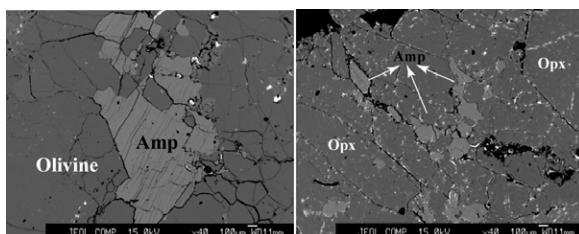
JIANLI SUI AND QICHENG FAN

Institute of Geology, China Earthquake Administration, Beijing 100029 (fqc@ies.ac.cn)

A new potassic amphibole (BES Fig), which reveals important information of mantle evolution, is found in mantle xenoliths from the Quaternary volcanic field of Nuomin, NE China.

There are over 40 Quaternary volcanic centers distributed in the Nuomin River area, NE China. Mantle xenoliths from these volcanoes vary from spinel peridotites to garnet peridotites. P-T calculation indicates that these xenoliths come from a wide range of depth from ~40 km to over 75 km. The amphibole, in size of sub-mm to mm, is found in garnet peridotites. Most of the garnet minerals have kelyphite rims, which records rich information of mantle evolution, and the origin of the potassic amphibole may be associated with the evolution.

Electronic probe data (Table) reveal that the amphibole is potassium- and titanium- rich, with $K_2O > 9wt\%$ and $TiO_2 > 7wt\%$. Since the amphiboles have more potassium than sodium (Na_2O 0~1%wt), it is not very common and hardly known, even not in the recent classification system of amphibole by Hawthorne *et al.* (2007). The potassic amphibole indicates some mechanism of K-enrichment hidden in the dynamic evolution of the lithospheric upper mantle beneath NE China, and also reveals the water-saturated state of the upper mantle.



	SiO ₂	TiO ₂	Cr ₂ O ₃	Al ₂ O ₃	FeO	MgO	CaO	Na ₂ O	K ₂ O	Total
amp	36.61	7.74	0.88	14.23	4.68	18.16	0.01	0.35	9.31	92.32
	Si	Ti	Cr	Al	Fe	Mg	Ca	Na	K	Total
amp	5.6773	0.902	0.1073	2.6011	0.61	4.197	0.001	0.106	1.841	16.039

Supported by DF-IGCEA-0608-2-13.

Sr-Nd isotopic variations in the Central Indian Basin surface sediments

N.P. SUKUMARAN^{1*}, J.N. PATTAN², G. PARTHIBAN²
AND Y.J. BHASKAR RAO¹

¹National Geophysical Research Institute (CSIR), Hyderabad, INDIA- 500 007

(*correspondence: npsukumaran@ngri.res.in)

²National Institute of Oceanography (CSIR), Goa, INDIA- 403 004

Understanding the origin and nature of chemical and clastic sediments within ocean basins adds to our understanding of the depositional environment and sediment sources. Particularly interesting is the Central Indian Basin (CIB) where previous geochemical and limited radiogenic isotopes analyses have highlighted the great diversity in source compositions reflecting variable contributions of detrital material of continental and volcanic origins, and biogenic materials.

As part of this effort, we analyzed the Sr Nd isotopic compositions and concentrations by TIMS on 11 core top sediments recovered at depths >5000m in the CIB. We utilized a multi-component isotopic approach that combines analysis of bulk sediments with its detrital and authigenic fractions. To differentiate authigenic fraction from the lithogenic ones, we leached the bulk sediments with 0.25N HCl and considered the residual and leachable fractions to represent the lithogenic and authigenic components of the sediment.

Unleached bulk sediments have ⁸⁷Sr/⁸⁶Sr ratios and Sr concentrations varying between 0.71042 - 0.71197 and 150-270ppm. εNd values and Nd concentrations between -10.2 to -7.9 and 21-60ppm. At a first glance, the observed variability in Sr and Nd isotopes reflects changes in sediment lithology rather than provenance. Measured ⁸⁷Sr/⁸⁶Sr of leachate range from 0.70913 to 0.70927 (mean 0.709163 ±46), indistinguishable from that of present day seawater (~0.709160). The leachates εNd value ranges from -8.9 to -7.4 (mean -7.87 ±0.61) with most of them clusters around -8. Leachates Sr and Nd isotopic compositions are consistent with the data for Mn crusts and nodules in the region, thus suggesting seawater origin. Detrital residues have ⁸⁷Sr/⁸⁶Sr compositions range from 0.71176 to 0.71743 and εNd of -11.5 to -9.6. We use these data to delineate the potential sources, estimate their quantitative contributions and address the broader implications of terrigenous inputs to the CIB.