REGIONAL VARIATIONS OF THE XENOLITH'S COMPOSITION AND THE UPPER MANTLE STRUCTURE.

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As well known modern ideas about the mantle evolution concentrate petrochemical investigations of the xenoliths upon MgO, Al2O3, CaO abundances. Our studies of spinel lherzolites from Far East Russia alkalic basalts indicate that much more important information may be contained in SiO2 and FeO variations.

1. The average compositions of petrochemically homogeneous xenolith's groups from different localities are placed into two clusters, divided by a gap on the FeO-SiO2 plot.
2. In some localities lherzolites from different homogeneous groups were recognised also among the large sample's assemblages.
3. Further analysis shows that the average compositions from each cluster have clear negative trends between FeO and MgO. There are no such correlations, if the xenoliths from different groups and clusters are mixed and considered simultaneously.
4. If to take the compositions belonging to the same cluster, they shift from locality to locality with a striking regularity. Though the number of the studied localities still scant, this is confirmed by spatial coincidence of the variation patterns for the two clusters and their clear connection with the tectonic framework of the region. The variation center of xenolith's compositions corresponds to a stable Khanka block - the most ancient tectonic unit of the region and adjacent areas.

The same approach has been used in order to decipher the variation structures of peridotite compositons from three other xenolith's provinces: Eastern China, Western USA and Western Europe. In each case the same petrochemical pattern was obtained. The average compositions of petrochemically homogeneous xenolith's groups from different localities are placed into two clusters on the FeO-SiO2 plot. For each cluster in each region there is a clear negative trend between FeO and MgO. The average compositions belonging to the same xenolith's cluster shift from locality to locality regularly. And most important is that spatial patterns in all regions have striking connections with ancient tectonic units: the China platform, Colorado plateau, and Baltic shield.

The petrochemical structure described cannot be interpreted in terms of degrees of depletion, but has a very simple and the only one from our point of view, explanation. The peridotite upper mantle is chemically layered and a FeO-SiO2 diagram displays its stratification. Strict trends between MgO and FeO contents for xenoliths from different localities show that the average composition of each homogeneous layer changes regularly in a regional scale .

Certainly, the striking link between the mantle variation centers and ancient block's settings has the most significance.

The nature of this relationship has become apparent in case of the West Europe xenolith's province. The reconstructed variation surface of the main mantle layer has oval, elongate (NE) morphology and extends right up to the northern boundary of the Alpine fold system. The variation centre is located beneath the Baltic shield, FeO decreases, and SiO2,MgO increase in its direction. The last principal feature important for understanding is that the European rift zone stretches along the axis of the discovered variation surface. The relations stressed above leave little room for doubt that petrochemical patterns reflect the existence of ancient megadome in the upper mantle.