

## Chlorine isotopes of salts xenoliths from Udachnaya-East kimberlite pipe (Russia)

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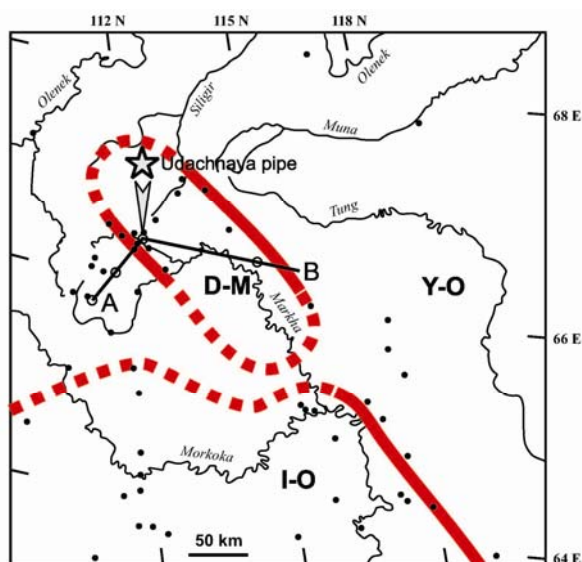
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### Introduction and geological setting

Rock salt are spectacular components of the Udachnaya-East kimberlite, and has attracted considerable attention (Kamenetsky et al., 2004, 2006; 2007a, b; Maas et al., 2005; Golovin et al., 2007; Sharygin et al., 2007a, b). In this volume (Polozov et al.) we present new data on the geological occurrence of the kimberlite-hosted rock salt, the mineral content and the chlorine isotope composition of the halides. We show that the rock salt represents xenoliths from the surrounding Cambrian evaporite rocks that underwent thermal metamorphism and local melting after emplacement in the kimberlite melt.

### Sampling and analytical approach

XRD analyses show that the xenoliths are dominated by halite with minor amounts of sylvine, calcite, and clay minerals. We have analyzed the chlorine isotope composition of six Udachnaya pipe halite samples. Core and rim samples were analyzed from two of the xenoliths. The resulting  $\delta^{37}\text{Cl}$  values fall into the evaporite range (+0.47 to -0.43‰), in agreement with published evaporite data (Sharp et al., 2007). For the individual xenoliths, the  $\delta^{37}\text{Cl}$  values decrease from core to rim.

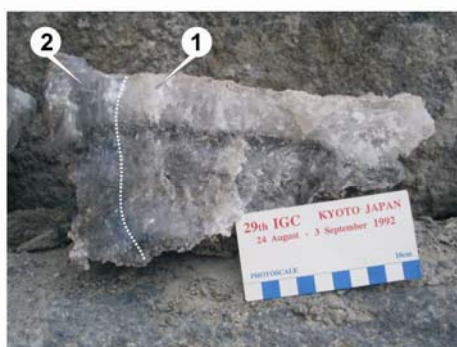


Irkutsk – Olekma (I-O) carbonate platform and Daldyn – Markha (D-M) carbonate bank conjugated with Yudom-Olenek (Y-O) basin at Late Amga (Middle Cambrian) Time. Reef margins established (solid line) and proposed (dotted line) compiled from Sukhov (2001) and Kononov et al. (2007). Dots are prospecting boreholes and A-B line is the cross-section. Geological setting of Udachnaya kimberlite pipe presented in the other contribution (Polozov et al., this volume).

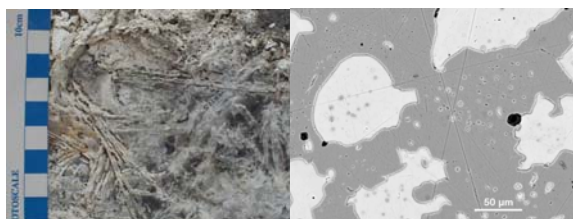
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Salt xenoliths composed mainly by salts with minor other minerals. Xenoliths demonstrate visibly different compositions at core and rims. These parts were studied separately with using XRD, EPMA and chlorine isotopes.



Complex intergrowing between sylvite and halite were revealed in salts from carbonate-halide xenoliths by EPMA, however, its chlorine isotopes fall into interval of sedimentary salts.

## Conclusion

Our results demonstrate a sedimentary origin of salts from Udachnaya-East pipe. We speculate that the isotope depletion along the xenolith rims is due to diffusion processes. The results are important for understanding the geochemical cycle of chlorine, as the suggestion that the kimberlite salt  $\delta^{37}\text{Cl}$  represents mantle  $\delta^{37}\text{Cl}$  (Sharp et al., 2007) can be discarded.

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