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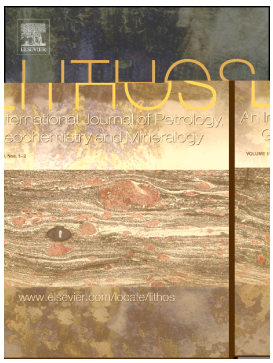


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# Inclusions of crichtonite-group minerals in Cr-pyropes from the Internatsionalnaya kimberlite pipe, Siberian Craton: crystal chemistry, parageneses and relationships to mantle metasomatism

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## ABSTRACT

Cr-pyrope xenocrysts and associated inclusions of crichtonite-group minerals from the Internatsionalnaya kimberlite pipe were studied to provide new insights into processes in the lithospheric mantle beneath the Mirny kimberlite field, Siberian craton. Pyropes are predominantly of lherzolitic paragenesis ($Cr_2O_3$ 2-6 wt%) and have trace-element spectra typical for garnets from fertile mantle (gradual increase in chondrite-normalized values from LREE to MREE-HREE). Crichtonite-group minerals commonly occur as monomineralic elongated inclusions, mostly in association with rutile, Mg-ilmenite and Cr-spinel within individual grains of pyrope. Sample INT-266 hosts intergrowth of crichtonite-group mineral and Cl-apatite, while sample INT-324 contains polymineralic apatite- and dolomite-bearing assemblages. Crichtonite-group minerals are Al-rich (1.1-4.5 wt% $Al_2O_3$), moderately Zr-enriched (1.3-4.3 wt% $ZrO_2$), and are Ca-, Sr-, and occasionally Ba-dominant in terms of A-site occupancy; they also contain