

LETTER

**Structural parameters of chromite included in diamond and kimberlites from Siberia:
A new tool for discriminating ultramafic source**

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ABSTRACT

Siberian chromite included in diamond, kimberlite, and spinel peridotite as well as Cr-spinel from garnet-spinel peridotite have been studied by single-crystal X-ray diffraction and electron microprobe analysis. Cell edges and oxygen positional parameters, u , of chromite in diamond and in kimberlite are comparable (cell edge, 8.3249–8.3390 Å; u , 0.26175–0.26213). The structural parameters of chromite in the spinel peridotite are similar to those of chromite grains from ophiolitic complexes, and those of Cr-spinel from garnet-spinel peridotite are comparable to those of Cr-spinel in lherzolitic mantle xenoliths. With the exception of the chromite in garnet-spinel peridotite, all analyzed spinels have a high Cr content. Recasting the chemical analyses according to spinel stoichiometry reveals negligible or no Fe³⁺. Chrome spinel may be present in heavy concentrates derived from serpentinized mafic and ultramafic rocks as the sole surviving primary mineral and, as such, their particular structural and chemical parameters may represent a new prospecting tool for discriminating the ultramafic source.

Keywords: Siberia, diamond, chromite, crystal chemistry