Secondary formation of diopside with high kosmochlor component in peridotite xenoliths from North Island, New Zealand

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Pale green chromium- and sodium-rich diopsides (with high kosmochlor component) are observed in anhydrous Group I mantle xenoliths hosted by Quaternary hawaiites from North Island, New Zealand. The diopsides are characterized by high Cr2O3 (up to 5.1 wt.%) and Na2O (up to 3.2 wt.%). The diopsides also contain relatively high amounts of REE and are mildly enriched in LREE relative to HREE. The diopsides often form around chromian spinel and are generally accompanied by Alpoor (with less than 1.2 wt.% of Al2O3) and Si-rich orthopyroxenes replacing olivine grains. Textural and mineral chemical features indicate that the diopsides and orthopyroxenes have formed secondarily as a result of metasomatism by Na, Ca, Si and REE-rich anhydrous melt (or fluid).