

LETTER

A natural scandian garnet

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ABSTRACT

Garnet from an aposkarn achtarandite-bearing rodingite-like rock in Sakha-Yakutia, Russia, has a Sc content close to 6 wt% Sc₂O₃ (~0.45 apfu). The scandian garnet is a relict mineral from a high-temperature, shallow-level melilite skarn. Structural and electron microprobe data for a crystal of the scandian garnet with cell parameter $a = 12.331(1)$ Å, $Ia\bar{3}d$ allows refinement of the structural formula $(Ca_{2.97}Mg_{0.02}Y_{0.01})_{\Sigma 3}(Fe_{0.663}^{3+}Zr_{0.584}Ti_{0.294}^{4+}Sc_{0.153}Cr_{0.152}Mg_{0.094}Fe_{0.04}^{2+}Hf_{0.008}V_{0.003})_{\Sigma 2}(Si_{1.898}Al_{0.420}Ti_{0.359}Fe_{0.323}^{3+})_{\Sigma 3}O_{12}$. Investigation of the composition of many of the scandian garnets reveals the existence of a solid-solution between kimzeyite-schorlomite Ca₃(Zr,Ti)₂(Al,Fe)₂SiO₁₂ and the scandium analog of andradite Ca₃Sc₂Si₃O₁₂. This is the first report of a natural scandian garnet.