American Mineralogist, Volume 94, pages 210–221, 2009

Suhailite, a new ammonium trioctahedral mica

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Abstract

A new ammonium-bearing trioctahedral mica (suhailite) has been found in gneisses from the Betic Cordillera (Spain). Suhailite appears as aggregates of golden grains unoriented with respect to the main foliation. It shows weak pleochroism from light to darker yellow and low birefringence (0.028). X-ray data indicate the presence of two compositional variations: a NH_4-rich phase (with a basal spacing of 10.40–10.44 Å) and a NH_4-K intermediate phase (with basal spacing of 10.20–10.26 Å). Average composition, as deduced from analyses obtained at the scale of the scanning electron microscope is $[Ca_{0.04}Na_{0.07}K_{0.35}(NH_4)_{0.55}](Al_{0.42}Ti_{0.22}Fe_{1.33}Mn_{0.01}Mg_{0.71})_{\Sigma=2.70}(Si_{2.67}Al_{1.33})O_{10}(OH)_2$. Thermal data indicate that maximum NH_4 detachment occurs at 502 °C, suggesting a thermal stability similar to tobelite. Textural data indicate that unoriented golden grains consist of fine intergrowths of annite and suhailite and suggest that suhailite formed from primary red annite during the annite to fibrolite transformation.

Keywords: Annite, Betic Cordillera, suhailite, SEM, TEM/AEM, XRD