

Chromium- and iron-bearing purple to purplish red taaffeites

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Taaffeite is an extremely rare gem mineral, with the formula $\text{BeMg}_3\text{Al}_8\text{O}_{16}$. Gemmological, microscopic, chemical and spectroscopic properties of eight chromium- and iron-bearing purple to purplish red taaffeites and two iron-bearing, chromium-free grayish violet samples from Sri Lanka and Myanmar were examined.

The taaffeites contain up to 0.33 wt.% Cr_2O_3 , up to 2.59 wt.% FeO and up to 2.24 wt.% ZnO. Chemical and spectroscopic data reveal a correlation between trace element contents and color of the samples, which is a complex function of the relative amounts of iron and chromium present in an individual taaffeite crystal. Optical properties and specific gravities of the 10 samples also correlate well with the sum of zinc, iron and chromium contents of the individual taaffeite crystals.

Apatites and zircons were frequently determined as mineral inclusions by Raman microspectrometry. Healing feathers consist of negative crystals that contained multiphase inclusions with magnesite crystals as solid component in addition to a fluid phase or two several fluid phases.

Spectroscopic properties of taaffeites are compared to those of iron- and chromium-bearing gem spinels.