



Mineralogical Characteristics of Serpentine jade and Thulite gemminerals from Booyo area, South Korea

A. Baatar and Won Sa Kim

Chungnam National University, Geology and Earth Environmental Sciences, Daejeon, Republic Of Korea
(amaraab16@gmail.com)

The mineralogical and gemological characteristics of the two gem minerals: serpentine jade and thulite from Booyo Mine area of South Korea were determined. The study of those minerals were carried out using polarizing microscope for textural study; color set, hardness pencil set and refractometer for determining physical characteristics; X-ray powder diffraction for analyzing crystal structure; XRF, ICP-MS, IR-ray, UV-ray and DTA/TGA analyses for detailed chemistry.

Serpentine jade consists of antigorite, one of the three polymorph of serpentine. It displayed dark green color with greasy luster and was transparent or semi-transparent. Magnetite was observed as inclusion in serpentine jade. XRD data confirmed that serpentine jade from Booyo consists of antigorite. Physical properties of serpentine jade were found as $R_i=1.56$, $SG=2.57$ and $H=5-6$. Major chemical composition was SiO_2 42.49%, MgO 39.08%, Fe_2O_3 3.85% and H_2O 11.87% and trace elements were Cr (2188 ppm), Ni (1110 ppm) and Ta (108 ppm). The DTA curve for serpentine jade showed endothermic peak at $755.0^\circ C$ related with the decomposition of the mineral by expulsion of the structural water and exothermic peak at $830.1^\circ C$ related with structural change of antigorite to olivine. Thulite displayed pink color, and was a variety of clinozoisite. It showed vitreous luster and was almost opaque. Physical properties of thulite were $R_i=1.69$, $SG=3.15$ and $H=6-6.5$. Chlorite was contained in thulite as inclusion. XRD data of thulite compares well that of clinozoisite. Major composition of thulite was SiO_2 44.35%, Al_2O_3 22.29%, Fe_2O_3 2.40%, CaO 21.46%, MgO 7.12%, MnO 0.22% and H_2O 1.52%, and trace elements were Sr (1715 ppm), Ni (180 ppm) and Ta (2030 ppm). DTA curve for thulite showed endothermic peak at $969.1^\circ C$ related with the decomposition of the mineral by expulsion of the structural water.