COLOUR ENHANCEMENT OF RATANAKIRI (CAMBODIA) GEM ZIRCON

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Gem zircon from the Ratanakiri province, Northeastern Cambodia, is famous for its particularly rich blue colouration (BALMER et al., 2011). The blue colour is however not natural but produced only by dry heating of initially brown to reddish brown stones at ca. 1000 °C under reducing conditions for several hours. We present first results of a study of the Ratanakiri zircon that focuses on its mineralogical characterisation and possible causes of the colour change. Gem-quality zircon specimens (6–19 mm in size) were oriented using a single-crystal X-ray diffractometer, and pairs of doubly polished slabs were produced. One slab each was subjected to heat treatment. Raman, luminescence and X-ray analyses on natural and heated slabs did not yield significant differences, indicating that the Ratanakiri zircon has accumulated negligible amounts of radiation damage. The brown colour of the natural material is due to a combination of broad absorption bands near 20500 and 12000 cm^{-1} and an intense absorption edge extending into the blue region. After heating, the absorption is less intense and dominated by a newly formed, pleochroic colour centre near 15500 cm^{-1}.

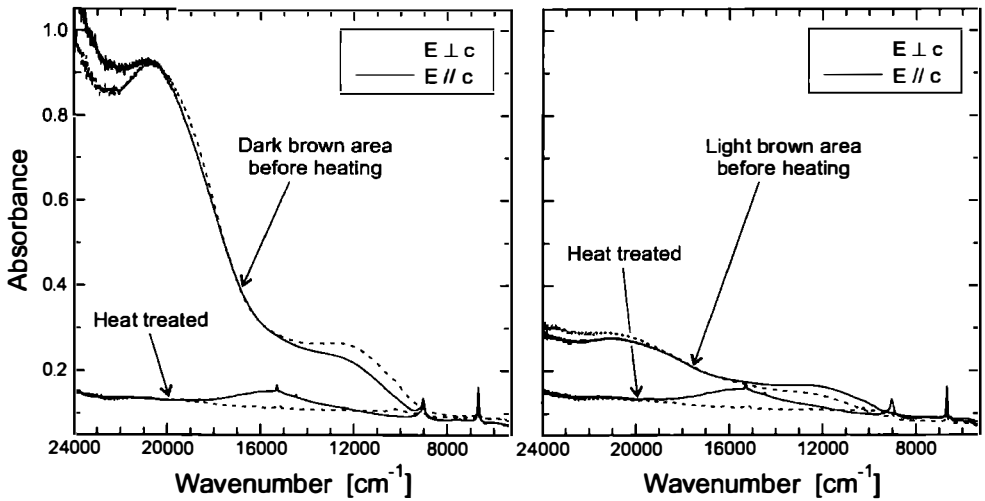

Figure1. Optical absorption spectra for two zones in one oriented zircon slab (left, intensely coloured area; right, light area), obtained before and after heat treatment.

BALMER, W.A., SMITH, M.H., SRIPRASERT, B., WANTHANACHAISAENG, B. (2011): Ratanakiri, the legendary zircon province of Cambodia. Abstracts of GIA's 46th Gemstone Gathering, Bangkok, Thailand, May 25, 2011.