The 2nd International Gem & Jewelry Conference (GIT 2008) December 11-14, 2008, Bangkok and Kanchanaburi, Thailand

Ti distribution in colour-zoned sapphire

***Nantharat Bunnag*[1,2]*, Panjawan Thanasuthipitak*[2]*, and Theerapongs Thanasuthipitak*[2]

1 Faculty of Gems, Burapha University, Chanthaburi Campus, Thailand

2 Department of Geological Sciences, Faculty of Science, Chiang Mai University, Thailand

Extended Abstract

A colourless sapphire with blue angular colour zoning was used to study the distribution of colouring trace elements. Chemical compositions of the sample was determined using electron probe microanalysis with wavelength dispersive X-ray fluorescent spectrometry (EPMA-WDS). The analysis was made along a line across different colour zones of the sample. Cathodoluminescence (CL) image of the sample was obtained by scanning electron microscope (SEM) equipped with cathodoluminescence detector. These analyses were carried out at the Department of Mineralogy, Natural History Museum, London.

The sample shows variation of iron and titanium oxide across the colourless, light blue and blue areas. The chemical data are given in Table 1. Titanium is present only in the light blue to blue area (Figures 1 and 2). Iron contents decrease from blue to colourless area. The Fe element map (Figure 2) shows a more or less uniform distribution of the element across the analyzed area Ti element map shows higher Ti concentration along the blue zone. The distribution of Ti is also shown in the CL image (Figure 2), which reveals 3-direction orientation of fine acicular Ti-mineral inclusions in the light blue to colourless area.