Ascertain an Optimum Temperature and Soaking Time to Enhance the Colour of *"Maangu"* Tourmaline

I.L.C.S. Wickramarathna[1], R.G.C. Jaliya [1], S. Illangasinghe[2]*, S. Diyabalanage[2] and P. Francis'

Department of Science and Technology, Uva Wellassa University, Badulla, Sri Lanka
'Gem and Jewelhy Research and Training Institute, Rathnapura,,Sri Lanka

"Maangu" is untagged stone in tourmaline group. The large amount of *"Maangu"* stones are found in Sri Lanka than other tourmaline verities. Since *"Maangu* "have less transparent appearance, they are seldom in jewellery items or any other decorative items. investigatig the enhancement of colour or change of colour of *"Maangu"* by heat treatment was the objective of this research. Heat treatments were done by using *"Lakmini"* furnace and electrical furnace, to identity appropriate furnace for industry scale operations. Samples were heated at 650 ℃, 680 ℃, 710 ℃, 750 ℃, 850 ℃ and 900 ℃ for 2 to 4 hours in oxidation condition to discover the temperature changes and corresponding colour changes. Results were remained unchanged after heating at 650 ℃.A slight colour enhancement appeared in 680 ℃. Slight brown colour enhancement appeared in 750 ℃. The Brown colour started decreasing in 900 ℃. Brown colour visually appeared in two samples at 850 ℃. X-ray Fluorescence Spectrometry shows that *"Maangu"* contain Silicon, Aluminum and Magnesium as major elements ranging 12-68%, 7-35% and 2-9.5%, respectively, while Titanium, Iron, Vanadium, Chromium, and Manganese recorded as trace elements. Final results show that no any significant change before and after the heat treatment with to Fourier Transform Infrared Spectrometer. As a conclusion, optimum temperature and soaking time to improve the hue, saturation and tone of the stone is 850 ℃ in more than four hours.

Keywords: Maangu, Tourmaline, Heat treatment, Chemical analysis