

FURTHER ENHANCEMENT OF QUALITY OF GAS HEAT TREATED GEUDA USING ELECTRIC HEAT TREATMENT

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Geuda is variety of corundum which has not got an attractive colour and transparency. But this material could be heat treated to gain an attractive colour and transparency. According to the appearance geuda is classified as diesel, dun, silky, milky and ottu etc. These varieties change in colour and transparency with heat treatment and under specific conditions. At present 80 % of the sapphires are found in the form of geuda. Geuda (corundum) requires heat treatment under reducing conditions to develop blue colour with specific conditions such as soaking temperatures and soaking periods.

Geuda are converted to blue sapphire using gas heat treatment in Lakmini furnace and final enhancement of colour is carried out by an electric furnace with heat treatment for a longer period of time. This process is carried out by only a few heat treaters and the conditions are not freely disclosed.

Present study is focused to observe the further enhancement of colour of geuda converted blue sapphires under basic conditions such as neutral atmospheric conditions and specific temperatures for a period of 720 hours of continuous electric heat treatment.

Before the treatment, the selected geuda samples were visually examined, examined under 10 power magnification, fourier transform infrared absorbance spectra and photo images obtained.

Samples were subjected to gas heat treatment for a soaking temperature of 1850 °C for a soaking period of one and a half hours. The treated blue sapphires were subjected to electric heat treatment respectively at 1550°C, 1650°C and 1750°C under neutral atmospheric conditions for period of 720 hours and the appearance of such treated sapphires were studied under naked eye, under 10 power magnification and the colour grading is obtained using the colour grading set of the Gemmological Institute of America (GIA), fourier transform infrared absorbance spectra and photo images were obtained for comparison.

Results of the present study clearly indicate that further enhancement of colour can be attained under the electric heat treatment of silky geuda converted gas heat treated blue sapphires. With the increase of temperature the colour of electrically heat treated blue sapphires had increased appreciably.