COLOUR CHANGES IN THE TRANSFORMATION OF GEUDA TO SAPPHIRE

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The colour of corundum is mainly due to traces of impurities. The colour is dependent not only on the impurities, but also on other factors such as:

thickness of the specimen;
cut shape of the specimen;
axis of the specimen etc.

The blue colour of sapphire as seen in natural specimens is derived from a subtle interaction between two impurities, iron and titanium. This colour can be further modified by the presence of other impurities, such as red, causing chromium. The exact shade of blue also depends not only on the relative amount of iron and titanium present, but also on the valency state involved, namely Fe^{2}_{+}, Fe^{3}_{+} as well as Ti^{3}_{+} and Ti^{4}_{+}.

A few dark sapphire "black ottu" specimens were heated up to 1800^{o} under an oxidising environment. The colour of the specimen became lighter.

The specimens were heated again under reducing condition. A colour that is acceptable for Gems was obtained. Analysis of the specimens show the high Fe distribution in the surface.