

ROYAL GEMSTONE SAPPHIRE

A Sapphire is a variety of the species corundum that is any colour except red. Corundum with red colour is known as ruby. . In India, sapphire are famous with their market name as Neelam, Pukhraj and Padapradshah for Blue, yellow and orange sapphires respectively, while Ruby is known as Manek in Indian market. Sapphires are the most precious, valuable and famous gemstones . Among the three popular sapphire colours, blue is the most loved. They have retained their high value throughout the centuries. It has an excellent colour, hardness, durability and lustre. Considered to be a royal stone, it held great value even in the ancient times. Many mystical connections and magical properties have been ascribed to sapphire.



Kashmir, Burma, Sri Lanka, Australia, Madagascar, Montana (USA), Tanzania, Brazil, Vietnam, Kenya, Thailand and Cambodia are well known localities for sapphires. Kashmir Blue sapphires which are also called as Corn flower Blue sapphires, are rare in any size, world famous and highly priced. Sri Lanka provides the majority of sapphires in today's market. Sri Lankan sapphires more commonly known as Ceylon sapphires.

Sapphire is crystalline aluminium oxide, Al_2O_3 , and belongs to trigonal crystal system. Optically it is doubly refractive with refractive index 1.760-1.768 and birefringence 0.008. Vitreous lustre and hardness of 9 on the Mohs scale. This property, paired with toughness and durability, make sapphires quite desirable gemstones. Specific gravity of Corundum varies between 3.95 – 4.10. Merely by replacing a few aluminium ions in the atomic arrangement of corundum with iron and titanium, as oxides, sapphire acquires attractive blue colour. Chromium cause the red colour to Ruby while Iron is responsible for Yellow sapphire.

Blue Zoisite, blue Spinel, Kyanite and paste are used as simulants for blue sapphire as the value of a simulant is only fraction of the true sapphire. A sapphire can also be grown synthetically in a laboratory. Treatment offers a way of turning sapphires of less desired quality into highly attractive gems. Heating has been applied for centuries to improve both the colour and clarity in corundum. While Titanium and Beryllium diffusion is done to enhance the colour and lead glass is filled to improve clarity of sapphire. However, each treatment must be properly and accurately disclosed, as the presence and the type of treatments influence the value of a sapphire significantly.

Gemmological Institute of India (GII) is a renowned institute for imparting gemmology training to contribute to trained man power and testing of gems, diamonds and jewellery, and grading diamonds to assist Gem & Jewellery industry. Detection methods of sapphire and other gems in GII laboratory involves both conventional and advanced gemmological testing methods using state of the art spectroscopic instruments. The routine testing in GII comprises of identification of gemstones by conventional methods and heat treatments using FTIR and Raman spectroscope. Chromophores are identified using UV visible spectrometers, elemental analysis done using Energy- dispersive X-ray fluorescence (EDXRF) and Beryllium diffusion is analysed with the help of LIBS. Main objective of GII is to provide test reports to customers that reflect inherent competence and expertise and these certificates are value addition to their goods.

References:

1. Gem and Gemology , Vol.19, No.2, Summer 1983.
2. Precious Stones and Gems, Their History, Source and Characteristics.
3. GII website www.giionline.com