Title : Gemological Characteristics, and the Cause of Iridescence in jewelry made from Abalone Shell.

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ABSTRACT

This research aims to investigate the gemological characteristics and the underlying causes of iridescence in jewelry made from abalone shell. The study utilized 10 samples of assembled gemstones, with 5 samples exhibiting distinct iridescent colors separated from their adhesive layers to enhance analytical precision. Results showed an average specific gravity of 2.495, which is lower than the natural abalone shell standard of 2.700–2.900 due to the influence of residual glue and resin. Optical analysis via UV-Vis-NIR spectrophotometry revealed absorption spectra in the 230–280 nanometer range, attributed to the organic protein matrix located between aragonite crystals that provides structural strength. Chemical and structural analysis using Scanning Electron Microscopy (SEM) identified the primary elements as Calcium (39.14%), Oxygen (38.60%), and Carbon (21.60%). It is concluded that the iridescence arises from the internal laminated structure of aragonite crystals within the nacre. This specific arrangement induces light interference and diffraction upon hitting the surface, resulting in the complex play of color and unique iridescence characteristic of the abalone shell.

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