Title : The physical characteristics and chemical composition of coral claimed to be from Philippines.

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Major : Gemology

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ABSTRACT

Abstract

Coral is an organic gemstone composed of calcium carbonate ($CaCO_3$). Some types have a structure of aragonite. The coral beads studied in this research are divided into two groups. 10 samples of blue coral beads 10 samples of red coral beads. A total of 20 samples, each with a diameter of 8 millimeters, were analyzed. Basic instrument testing revealed that the specific gravity ranged from 1.80 to 2.20. Examined under ultraviolet radiation at both short-wave and long-wave ranges, no fluorescence was inert. Advanced instrumental analysis, using X-ray diffraction to study the chemical composition, result that blue coral consists of aragonite, that red coral consists of aragonite and contains magnesium calcite, a major

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component of corals found in marine environments. Fourier-transform infrared spectroscopy analysis of coral powder revealed the following absorption patterns for red coral The absorption band between 800 and 850 cm^{-1} corresponds to the C–O out-of-plane bend. The band at 1,483 cm^{-1} corresponds to the CO_3^{2-} asymmetric stretching. The absorption in the 3,200–3,600 cm^{-1} range corresponds to the O–H stretching of water. For blue coral showed absorption band at 800 cm^{-1} corresponds to the C–O out-of-plane bend, indicating the presence of aragonite, at 1080 cm^{-1} corresponds to the CO_3^{2-} symmetric stretching. The band at 1,480 cm^{-1} corresponds to the CO_3^{2-} asymmetric stretching. Showed absorption in the 3,200–3,600 cm^{-1} range corresponds to the O–H stretching of water. Scanning electron microscopes imagine blue and red coral beads showed a porous structure. Energy-dispersive X-ray spectroscopy analysis found that blue coral consists of calcium, carbon, and oxygen, but red coral consists of calcium, carbon, oxygen, and magnesium. It is suspected that magnesium maybe is a compound present as an impurity in the dyed.

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