Title : Gemological Characteristics and Chemical Composition of Imitation Pearls with the Trade Name Shell Pearl

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ABSTRACT

An imitation pearl is something that man-made materials to imitate a pearl. Most of them are made of plastic or glass. The imitation pearl known as the trade name Shell Pearl is an imitation pearl made from natural shells. It has a chemical composition similar to pearls. The chemical formula is calcium carbonate ($CaCO_3$), It comes in a variety of sizes, shapes, and colors. They have a uniformity of shape achieved by molding the seashell material and enhanced color through dyeing or coating to improve beauty and durability. It is often used as jewelry because it is cheap and can be used to make jewelry at a reasonable price. Regardless of the value of the product, if the product is damaged from use. In this study, a sample of 14 Shell Pearls was used to study gemological characteristics and chemical composition. All the samples are spherical in shape, ranging in diameter from 0.8 to 1.0 mm, and they were coated in a variety of colors, including white, yellow, red, pink, gray, and black. Their specific gravity was in the range of 2.60 to 2.74. They were inert under short-wave ultraviolet and long-wave ultraviolet. Scanning electron microscope

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studies from the image show the separation of layers between the coating substance and the shell pearl. The surface of the shell pearl showed crystalline characteristics in stacked plates. The chemical composition with energy-dispersive X-ray spectroscopy has shown that the coating substance and shell pearl areas are composed of calcium, carbon and oxygen. Infrared Absorption with Fourier Transform Infrared Spectrophotometer Shell pearl powder displayed absorption at the following positions: 700 cm^{-1} is the position of CO_3^{2-} in-plane bending, 862 cm^{-1} is the position of C-H bending, 1,083 cm^{-1} is the position of CO_3^{2-} symmetric stretching, 1,458 cm-1 is the position of CO_3^{2-} asymmetric stretching, 1,783 cm^{-1} is the position of C=O stretching and 3,449 cm^{-1} is the position of O-H stretching. X-ray Diffraction analysis revealed that the mineral compositions of samples contained only one type of aragonite mineral.

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