

Title : Gemological Characteristics, Chemical Composition and Cause of Color of Sakura Pink Opal claimed to be from Australia

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ABSTRACT

The 17 studied samples of Sakura Pink Opal beads were obtained from the 70th Bangkok Gems and Jewelry Fair and were investigated for their gemological properties, chemical composition, and cause of color. All samples were spherical shape, with a diameter of 8 millimeters, displaying alternating bands of deep translucent pink, light pink, and pinkish white. Internal features and inclusions were not observed. The samples weighed between 9.20 and 10.67 carats, with specific gravity values ranging from 2.24 to 2.44. They exhibited no fluorescence under both short-wave and long-wave ultraviolet light. Petrographic observation under a polarizing microscope revealed needle-like, spherical, and conical structures characteristic of microfossils from the radiolarian group. Chemical composition analysis using energy-dispersive X-ray spectroscopy detected only carbon, oxygen, and silicon. X-ray diffraction analysis identified the mineral composition as quartz and tridymite. Fourier-transform infrared spectroscopy showed hydroxyl bond

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absorption at approximately 1,160, 1,350, and 1,844 cm^{-1} , along with silicon dioxide bond absorption at around 700, 779, 800, and 1,080 cm^{-1} . These absorption bands closely matched those of chert rather than natural opal. The cause of color is proposed to result from the crystal structure and light scattering within the silica microcrystals. The arrangement and size of the silica crystals influence light reflection and absorption, leading to the observed coloration. Additionally, the presence of organic materials, such as fossilized plankton or radiolarians unique to chert, may contribute to the coloration. Based on these studied results, it is concluded that the Sakura Pink Opal samples are chert, a member of the silica mineral group. They possess physical properties similar to opal and exhibit banded color patterns resembling Australian pink opal. However, they are not true opals but rather chert used as an opal imitation.