

Pusanisa Suwansil 2009: Spectroscopic Studies of Thai and Chinese Freshwater Cultured Pearl. Master of Science (Physics), Major Field: Physics, Department of Physics. Thesis Advisor: Mr. Wiwat Wongkokua, Ph.D. 144 pages.

In order to develop Thai freshwater cultured pearl farming, it is essential and to for understanding the characteristic of pearl and shell. This research was carried out by comparative study between Thai and Chinese cultured pearl. Spectroscopic technics enable us to access microscopic information. SEM was employed to see small area on pearl surface in the level of micrometer. The surface and cross section of Thai and Chinese cultured pearl showed no difference. The crystal structure of pearl and shell were studied by using XRD. The majority of pearl crystal was aragonite while the minority was calcite. The outer shell of pearl exhibits more aragonite compared to the inner shell. Thai cultured pearl had more Mn^{2+} than Chinese cultured pearl analized by XRF. This caused the bigger unit cell compared to Chinese cultured pearl because the Mn^{2+} is bigger than the Ca^{2+} . The substitution of Mn^{2+} in the site of Ca^{2+} in the aragonite structure was confirmed by ESR. Moreover, the pearl colors such as purple, pink and brown showed the bonding of C – C and C = C which are in the structure of polyenes measured by Raman spectroscopy.

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Thesis Advisor's signature

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