

Phuttatida Chaisawas 2012: Study of Effective Chemical Component on Characteristics of Wood Fluorescence Spectra. Master of Science (Physics), Major Field: Physics, Department of Physics. Thesis Advisor: Mr. Apichart Pattanaporkratana, Ph.D. 165 pages.

This research aimed to study effective chemical components that characterized the fluorescence spectra of teak and soft woods used in furniture industry in Thailand. The wood sample were grinded to powder and removed extractives by soxhlet extraction. Lignin and holocellulose were then separately extracted from extractive – free samples. The fluorescence spectra excited by various light sources with wavelength of 365, 395 and 532 nm, and the transmission spectra from Fourier transforms infrared spectroscopy (FTIR) with attenuated total reflectance (ATR) were recorded and compared to the original wood powders. The result showed that the fluorescence spectra of holocellulose samples from the extraction wavelength of 532 nm were very similar to those of the original wood powders. The spectral shapes also showed dissimilarity between each sample. The spectra of holocellulose samples when excited by the wavelength of 365 and 395 nm and the FTIR spectra, on the other hand, looked similar and hard to differentiate. When excited by the 365 nm light, the fluorescence spectra of the holocellulose samples mostly showed some differences from those of the original wood powders. When the samples were statistically analyzed for similarity using Principle Component Analysis (PCA), the results showed that the original teak – powdered spectra when excited by wavelength of 365 and 532 nm were differentiable from those other soft woods. However, only the holocellulose spectra of teaks excited by the wavelength 532 nm were found to be differentiable.

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Thesis Advisor's signature