

## Solid State Spectroscopy of Vapochromic Nickel(II) Complexes

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Vapochromism is a color change that a compound undergoes when it is exposed to the vapor of a liquid, generally water or a volatile organic compound. Vapochromism has been studied in several compounds, mostly those involving gold or platinum cations. However, these compounds are expensive and possibly toxic. A cheaper, more readily available metal cation is needed. Nickel(II) meets both of these first criteria. Since Ni(II) can achieve a variety of coordination geometries, it is of further interest in this area.

The Ni(II) complex that was the subject of this research is a five coordinate complex in a square pyramidal arrangement. It was exposed to various vapors, including water and dichloromethane. UV-vis-near IR spectra were taken at various stages during the color change, and analyzed for changes. The spectra of the powders were taken by diffuse reflectance spectroscopy. The spectra were then analyzed to find the location of their band maxima, and the maxima and shapes of the curves were compared and contrasted. The angular overlap model was used to analyze the spectra, and the possibility of a weak coordination of the vapor molecule to the Ni(II) center.

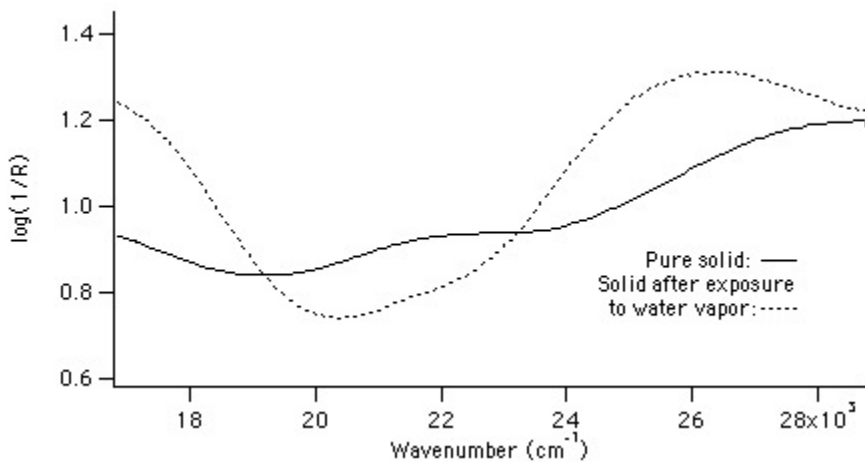


Figure: Sample diffuse reflectance spectra which shows change after exposure to water vapor