

# Synthesis and properties of indole based chemosensor

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## Abstract

We synthesized new dye sensor based on indole compound. Through the UV-vis absorptions, we analyzed chemosensing properties to explain metal binding properties. The peak absorptions increased at 472 nm when added metal cations( $\text{Cd}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Hg}^{2+}$ ,  $\text{Fe}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Ni}^{2+}$  and  $\text{Cr}^{3+}$ ) and gradually decreased the peak at 516 nm. Thus, this UV-Vis absorption behavior clearly showed the metal binding reaction. To measure energy level of used dye sensor, HOMO/LUMO energy value was calculated with cyclovaltagramm(CV) and using computational calculation method, in which we estimated the optimum structure of dye sensor. CV and computational calculation method, both compared to find suitable geometric structure. (with almost same energy values.) From the computational calculation, dye sensor has plane structure. So, Amine and ketone in the dye sensor faced each other and makes position to bind metal cations. In addition, these positions was supported pull-push electron system and generated MLCT process, when the dye sensor was bonded with the metal cations and resulted chemosensing properties. Through the electrochemical and computational calculation method analyze, we proposed the chemosensing principles that the dye sensor bind the metal cation between ketone and amine. Finally, the formation type of metal ion bindings was determined by Job's plot measurements.

## 참고문헌

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