



School of Integrated Technology (SIT)

SIT SEMINAR

- Energy Technology(ET)
- Culture Technology(CT)
- Intelligent Robotics Technology(RT)
- Common Subject

Thursday, September 7th, 2017, 2:30 PM.
Room No. 109, Dasan bldg. 1st Floor

(Host: Prof. Kim Hyeong Jin / Language: Korean)

*Electrochemistry for Various Compounds and
Electrocatalytic Reactions at Nano-structured Electrodes*

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In the first part of this presentation, I will show my old results for the redox chemistry for 16- vs. 18-electron organometallic compounds [1,2]. The 16-electron mononuclear complexes used are $[(\eta^5\text{-Cp})\text{Co}(\text{Cab}^{5,5})]$ ($\text{Cab}^{5,5} = 1,2\text{-S}_2\text{C}_2\text{B}_{10}\text{H}_{10}\text{-S,S'}$), $[(\eta^5\text{-Cp}^*)\text{Co}(\text{Cab}^{5,5})]$, and $[(\eta^5\text{-}p\text{-cymene})\text{Ru}(\text{Cab}^{5,5})]$. We found that 16-electron complexes had a reversible 0/-1 reduction with a much less reversible 0/+1 oxidation; the reversibility of the latter processes was improved upon the addition of a ligand (*i.e.*, it occurs via 18-electron complex, $[(\eta^5\text{-Cp})\text{Co}(\text{Cab}^{5,5})(\text{L})]$). However, the redox pattern of $[(\eta^5\text{-Cp}^*)\text{Co}(\text{Cab}^{5,5})(\text{L})]$ were more complicated than that of $[(\eta^5\text{-Cp})\text{Co}(\text{Cab}^{5,5})(\text{L})]$ because of differences in electron-donating ability and structural bulkiness between Cp and Cp*. We have observed elimination/recoordination of Lewis bases in the 18-electron complex, $[(\eta^5\text{-Cp}^*)\text{Co}(\text{Cab}^{5,5})(\text{L})]$ ($\text{L} = \text{PMe}_3, \text{PEt}_3, \text{PHPh}_2$), depending on the cone angle of the ligands. In the second part of this presentation, I will show some results for the electrocatalytic reactions including electrochemical sensing at nano-structured electrode surfaces [3-6]. Nano-structured materials were prepared by wet synthesis including electrodeposition or by CVD synthesis combined with electrospinning