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Synthesis and fluorescence studies of Cu (II), Ni (II) complexes with fused N-containing aromatics

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The chemistry of carbon-nitrogen double bond plays a vital role in the progresses of chemistry science. Metal complexes of Schiff base are extensively studied due to synthetic flexibility, selectivity and sensitivity towards a variety of metal atoms. They are found useful in catalysis, in medicine antibiotics and anti-inflammatory agents and in the industry as anticorrosion. Schiff base complexes are also important for designing complexes related to synthetic and natural oxygen carries. The complexes make these compounds effective and stereo specific catalysts for oxygen reduction and hydrolysis and they show biological activity, and other transformation of organic and inorganic chemistry. The interaction among DNA and metal complexes has some favourable features: The ligands can be attached to the metal in controlled manner; binding to DNA is usually accompanied by marked absorbance changes in the UV-vis frequency range and fluorescence emission too, due to excitation of charge transfer transitions. In this work macro cyclic of metal complexes, $[ML]Cl_2$, [L=3,10-bis(2-(p-X phenyl))-1,3,5,8,10,13-hexaazacyclodecane, M=CU, Ni ,X=H,NO_2] have been prepared and characterized by elemental analysis, Conductance measurements, UV-vis and FT-IR. The emission energy of the $[CuL]Cl_2$ in chloroform at room temperature is at ca. 440,491 nm and is assignable to interaligand florescence. So we synthesized macro cyclic complexes, characterized it, and also it will be monitored as a function of metal complex-DNA molar ratio by UV absorption spectroscopy and fluorescence spectroscopy.
M=Cu, Ni, X=NO_2, H

Keywords: Schiff base, Macro cyclic complexes, Biological activity, Florescence.

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Catalytic Application of Some Heteropolyacid Compounds in Esterification Reaction

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In the present study, initially preparation of some heteropolyacids such as, $H_3[PMo_{12}O_{40}]$, $H_4[SiW_{12}O_{40}]$, $H_6[P_2W_{18}O_{62}]$ and $H_{14}[NaP_5W_{30}O_{110}]$ were investigated. The mentioned heteropolyacids were prepared by the reaction between sodium molybdate and/ or tungstate in presence of PO_4^{3-} or SiO_3^{2-} ions, and then were characterized by UV-Vis and IR spectroscopy. Consequently, catalytic application synthesized heteropolyacids were noticed in esterification of phthalic anhydride at presence of 1-butanol. The reaction time and the amount of catalyst were varied in the range of 2-6 h and 0.1-0.8 g, respectively. The $H_6[P_2W_{18}O_{62}]$ catalyst had the best reactivity and efficiency among the investigated catalysts. It is to be noted that $H_3[PMo_{12}O_{40}]$ showed lower activity. Then, reaction conversion reaches to about 96% conversion within 5 h and 0.7 g using $H_6[P_2W_{18}O_{62}]$ catalyst. Finally, it can be concluded that application of those heteropolyacids caused relatively simplification of the esterification process, easy to work-up, lower cost, and lowering the acidic wastes, which all is environmentally greener.

Keywords: Heteropolyacid, Catalyst, Characterization, Esterification, Phthalic anhydride