22nd Iranian Chemistry Conference, 23-25 August, 2023
University of Kurdistan

Synthesis and characterization of a nickel(II) unsymmetrical salen complex as an efficient catalyst for selective oxidation of alcohols

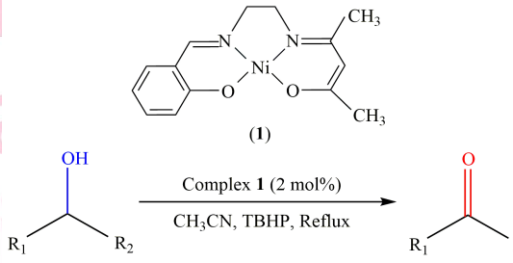
Mehdi Hatefi Ardakani[a,*], Zeynab Mohammadabadi and Mehdi Barati[a]

[a]*Department of Chemistry, Faculty of Science, Vali-e-Asr University of Rafsanjan, Rafsanjan, Iran*

[*] *E-mail: m.hatefi@vru.ac.ir*

Oxidation of alcohols to the carbonyl compounds is a major transformation in organic synthesis because the carbonyl compounds such as aldehydes and ketones are versatile intermediates for synthesizing various drugs, chemicals, vitamins, and fragrances [1]. Schiff base transition metal complexes are interesting oxidation catalysts owing to their easy synthesis and their chemical and thermal stability. Unsymmetrical Schiff base ligands are important compounds and received much attention due to the bounding of central metal ions with unsymmetrical ligands in natural systems [2].

In the present work, unsymmetrical Salen ligand was synthesized in good yield according to the published procedure [3], and then metallated with $NiCl_2.6H_2O$ to obtain complex **1**. The prepared complex **1** was characterized by FT-IR, UV-Vis, ^{1}HNMR, and elemental analysis. The synthesized complex **1** was successfully employed as a new and efficient homogeneous catalyst for selective oxidation of various alchols to the corresponding aldehydes and ketones under reflux conditions (Scheme1). Good to excellent yields and short reaction times can be mentioned as advantages of this method for oxidation of alcohols.



Scheme 1: Oxidation of alcohols catalyzed by complex **1**

Keywords: Unsymmetrical Schiff base, Nickel(II) complex, Homogeneous catalyst, Selective oxidation, Alcohol

References

[1] M. Zhang, Y. Zhai, S. Ru, D. Zang, S. Han, H. Yu, and Y. Wei, Chemical Communications, **2018,** 54, 10164.

[2] G. Grivani, S. Husseinzadeh Baghan, M. Vakili, A. Dehno Khalaji, V. Tahmasebi, V. Eigner, and M. Dusek, *Journal of Molecular Structure*, **2015,** 1082, 91.

[3] N.T.S. Phan, D.H. Brown, H. Adams, S.E. Spey, and P. Styring, *Dalton Transactions*, **2004,** 1348.