Synthesis of Thiazole by Nano Catalyzed

A. Coskun [1]

[1] *Department of Chemistry, Necmettin Erbakan University, Konya-42099, Turkey*
E-mail: acoskun42@gmail.com

Thiazoles are 5-membered cyclic compounds that nitrogen and sulfur group at different situation. This compound have a lot of derivations and because of its derivations type have a lot of application in various industries, medical science and pharmacy. In 1887, Hantzsch et al identified and established molecular structure of thiazoles [1]. In 1889, the first derivation of thiazoles identified by Prop et al and was named 2-amino thiazole [2]. After that until now, many derivations identified and reported. It was found that thiazoles system including of S-C-N bound and have biological specifications. So synthesis of thiazole derivations was become more important. Thiazole derivatives have also attracted increasing attention due to their numerous pharmacological applications and biological activities, such as anti-inflammatory, analgesic, antimicrobial, anti-HIV, antihypertensive and herbicidal activity [3,4].

Heterocyclic motifs are an important scaffold which has both pharmaceutical and industrial applications. These motifs can be prepared by using wide variety of reaction conditions such as the use of toxic solvent, expensive catalyst, harsh reaction condition like the use of high temperature, base and multistep reaction. Although various methods are involved, the chemistry arena is now shifted towards the greener way of synthesis. Nano catalyst constitutes an important role in the green synthesis. This is because the activity of the catalyst resides in the exposed portion of the particles. By decreasing the size of the catalyst, advantages such as more surface area would be exposed to the reactant, only negligible amount would be required to give the significant result and selectivity could be achieved, thereby, eliminating the undesired products. The present reaction shows the type of Nano catalyst involved in the thiazole ring formation [5].

This study gives knowledge about synthesis of thiazole derivatives by Nano-SiO_2 particle. It was reported experimental results on the synthesis of thiazole derivatives by using thiosemicarbazide and different aldehydes reacted with appropriate ketones in the presence of nano-SiO_2. All of the synthesized compounds were characterized by FT-IR and ^{1}H-NMR.

1. *Hantzsch A., Weber H. J.* The Hantszch thiazoles synthesis // Ber Dtsch Chem Ges. -1987.-**20**.-P. 3118-3132.
2. *Akbarzadeh A., Soleymanı R.* Synthesis New and Novel Aryl Thiazole Derivatives Compounds// Oriental Journal of Chem. -2012, **-28**. P. 153-164.
3. Verma, A.; Saraf, S.K. 4-thiazolidinone--a biologically active scaffold // Eur. J. Med. Chem. -2008. **-43(5).-** P. 897–905.
4. *Kucukguzel G., Kocatepe A.* Synthesis and Biological Activity of 4-Thiazolidinones, Thiosemicarbazides Derived from Diflunisal Hydrazide // European Journal of Medicinal Chem. -2006. **-41(3).** –P. 353-9.
5. Hemalatha K., Function of Nanocatalyst in Chemistry of Organic Compounds Revolution: An Overview // Journal of Nanomaterials , -2013, **-2013.**-P. 1-23.