The Usage Of Heterocyclic Composite Thiazolidine

Heterocyclic composites are imperative class of organic compounds which are present in various natural compounds such as chlorophyll, vitamins, haemoglobin, and alkaloids i.e. morphine, vinblastine etc and have broad application in many filed of science such as copolymers, dyestuff, sanitizers, and possess N, S, O and other heteroatom, which enhance their bioactivity owing to this it implies many pharmacological activities such as anti-cancer, antioxidants.

One of the most eminent heterocyclic motif, Thiazolidine is a five-membered heterocyclic system having formula C3H7NS containing one nitrogen and one sulfur atom which holds high medicinal and pharmaceutical properties. In thiazolidine nucleus, a large number of substitutions are possible on the 2, 4 and 5-positions which is going to enhance their properties. Variations in the substituents attached to the nitrogen atom are also possible to design new derivatives. Ciglitazone, Pioglitazone, Trolitazone, Englitazone, AL-321 etc. were considered as the most effective drugs for antidiabetic activity.

In additional thiazolidines are the main core of many type of natural products, drugs and were present in many synthetic compounds such as anticancer, antibacterial, antitumor, antidiabetic, anti-parasite, anti-inflammatory, antimicrobial, antitubercular antifungal, antiviral, anti-HIV, Cytotoxicity, antitrypanosomal, Antinociceptive and anti-hypernociceptive. In addition, the use of thiazolidines as the inhibitor of tyrosyl?DNAphosphodiesterase I pro-drugs for the treatment of cystinosis, Radioprotective against ?-Irradiation, S1P1 Receptor Agonists were reported.

They are used in Peptide and Protein Modification, protein chemical synthesis, as an activator to innate immunity and also act as Immunostimulating agents. Thiazolidine derivatives involve in various synthesis as synthetic precursor, potential biomarker for oxidative stress and formaldehyde exposure, heterogeneous catalyst, Free radical scavenger, antioxidant, inducible nitric oxide synthase (Inos) inhibitors and to construct nonfullerene small-molecule.

In past few years, divergent synthetic strategies introduced which aimed efficient, green synthesis using inexpensive reactant, nano-particles, non-toxic solvent, reusable catalyst and also in the absence of solvent and catalyst with high yields in different technique such as microwave irradiation (MWI), sonochemistry, and surface chemistry for the betterment of reaction conditions and to make it cost–effective. These immense feature of thiazolidine enforces us to study its literature and outlines the current status of thiazolidine and their derivatives and their biological significance.

Recently, Jain et al. reviewed the biological activities of thiazolidinone derivatives from 2000 to 2011. In 2013 Jain and co-author have reviewed the multifarious application of various thiazolidine-2,4-diones derivatives. Nanjan et al. reviewed antidiabetic activity of thiazolidinone. But there is not a detailed review on synthesis and biological activity of thiazolidines. So here we summaries a literature survey of different strategies developed for the synthesis of thiazolidines and their analogs as well as we highlight their activities and their use as starting material in the synthesis of various heterocyclic systems of potent pharmaceutical properties during the period of 2014 to 2018, hoping to inspire new and even more creative approaches.