

Title: Green Synthetic Strategies and Pharmaceutical Applications of Thiazine and its Derivatives: An Updated Review

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Abstract: Thiazines are a sizable class of organic heterocycles that are notable for their skeletal versatility and relative chemical simplicity, making them among the most flexible sources of biologically active compounds. The term "green synthesis" refers to implementing energy-efficient procedures for the nature-friendly production of materials and chemicals using green solvents, catalysts, and suitable reaction conditions. Considering the importance of green chemistry and the outstanding therapeutic profile of thiazines, the present work was designed to review the recent advances in green chemistry-based synthetic strategies of thiazine and its derivatives. The green synthetic approaches, including microwave-assisted, ultrasound-assisted, and various other synthetic methods for thiazine and its derivatives, were discussed and generalized. In addition, applications of thiazine and its derivatives in pharmaceutical sciences were explained with examples of marketed drugs. The discussed sustainable synthetic methods for thiazines and their derivatives could be useful in developing other medicinally important lead molecules. They could also aid in developing new synthetic schemes and apparatuses that may simplify chemical manufacturing processes and enable novel reactions with minimal by-products while questing for optimal, green solvents. This review can help anyone interested in this fascinating class of heterocycles to make decisions about selecting targets and tasks for future research.

Keywords: Thiazines; Catalyst; Green synthesis; Microwave assisted; Ultrasonication; Ultrasound-assisted

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