Ultrasound mediated green synthesis of rhodanine derivatives: synthesis, chemical behavior, and antibacterial activity

Abstract

A variety of rhodanine derivatives were synthesized via a three-component reaction of carbon disulfide, amines, and dialkyl acetylenedicarboxylate in polyethylene glycol under conventional stirring or ultrasound irradiation. The sonochemical-assisted procedure provides an improved and accelerated conversion when compared to the conventional reaction, with increased rate of reaction and quality of product obtained. The product formed, **2a**, could be readily converted to bis-rhodanine under microwave conditions. Moreover, the pyranothiazoles **9a,b** were prepared from the corresponding rhodanines **2a,b** and malononitrile. Fifteen compounds were screened for their antibacterial activities against nine human, animal and plant pathogenic Gram-positive and Gram-negative bacteria using the agar well diffusion method. Out of these derivatives, compounds **2g** and **2h** were the most effective against all tested bacteria.