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Tungstate sulfuric acid (TSA): An efficient and recycable catalyst for the synthesis of 4-aryl-3,4-dihydropyrimidin-2(1H)-thione derivatives as potential calcium channel blocker

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Background and Aims: Biginelli reaction used for the synthesis of dihydropyrimidinones (DHPMs), and their derivatives,they have occupied an important position in natural and synthetic organic chemistry because of their wide range of biological activities, such as calcium channel blockers, antiviral, antihypertensive, antibacterial.
Methods: 3,4-Dihydropyrimidin-2(1H)-thiones derivatives were synthesized in moderate to high yields in one-pot three component reaction from the corresponding aldehydes, 1,3- dicarbonyl compounds and thiourea, in the presence of catalytic amount of Tungstate sulfuric acid(TSA), under solvent-free conditions at 80ºC.
Results: The catalyst was used in 14 reactions , It is seen that several aromatic aldehydes carrying either electron-releasing or electron-withdrawing substituents in the ortho and para positions .The reactions are clean without any solvent and highly selective affording exclusively 4-aryl-3,4-dihydropyrimidin-2(1H)-thiones in high yields in a short reaction time with TSA as a non-toxic, recycable, inexpensive and easily available reagent.
Conclusions: TSA as an efficient catalyst for the synthesis of 3,4-dihydropyrimidin-2-(1H)-thione analogs by multicomponent Biginelli reactions. The protocol offers several advantages such as mild reaction conditions, short reaction times, easy isolation and good yields and experimental simplicity. Most of the methods that report these product use expensive reagents, strongly acidic condition, require long reaction time, and give unsatisfactory yield.we can use this catalyst for the other reactions that need mild acidic codition.

Keywords: Dihydropyrimidin; Biological activities; Tungstate sulfuric acid