Patent Search

Invention Title	SYNTHESIS OF AZLACTONES THROUGH MICROWAVE IRRADIATION USING ZIRCONIUM-PHOSPHORUS CO-DOPED TITANIUM OXIDE NANO PHOTOCATALYST
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Abstract:

ABSTRACT: Title: Synthesis of Azlactones through Microwave Irradiation Using Zirconium-Phosphorus Co-Doped Titanium Oxide Nano Photocatalyst The present disclosur proposes a novel and efficient method for azlactones synthesis through microwave irradiation using zirconium (Zr) and phosphorus (P) co-doped titanium dioxide (TiO2) n photocatalyst, thereby achieving efficient yields in significantly shorter time intervals. The method reduces reaction time from at least 1-2 hr to just 3-5 min, thereby offerir substantial improvement over conventional method. The method utilizes a novel zirconium (Zr) and phosphorus (P) co-doped titanium dioxide (TiO2) nano photocatalyst, achieves efficient yields at least 96 %, thereby ensuring high product purity and reducing the need for additional purification process. The method adheres to green chemi principles by minimizing the use of toxic reagents and reducing waste, thereby making the process safer and more sustainable.

Complete Specification

Description:DESCRIPTION:

Field of the invention:

[0001] The present disclosure generally relates to the technical field of nanotechnology and, in particular, relates to a novel and efficient method for azlactones synthesis through microwave irradiation using zirconium (Zr) and phosphorus (P) co-doped titanium dioxide (TiO2) nano photocatalyst, thereby achieving efficient yields in significantly shorter time intervals.

Background of the invention:

[0002] Nanoscience and nanotechnology have made significant progress over the past decade. Many studies have demonstrated that nano catalysts offer impressive performance in terms of selectivity, reactivity, and increased product yields. The nanoparticles provide more active sites per unit area compared to their larger counterpa due to their high surface-to-volume ratio. Traditional homogeneous catalysis has limitations such as instability, non-recyclability of the catalyst, and the use of expensive hazardous reagents, which often result in lower yields of the desired products.

[0003] Recently, nanoparticles have gained attention as potential heterogeneous nano photocatalysts due to their superior properties compared to bulk materials. Nano metal oxides, in particular, have intrigued researchers because of their outstanding physical and chemical catalytic capabilities. Nano titanium dioxide (nano-TiO2) is especially popular in various industrial applications related to catalysis. The nano-TiO2 is used for the selective reduction of nitrite or nitrate ions, photocatalysis in organ synthesis, pollutant removal, as well as in photovoltaic devices, sensors, and paints. Studies have highlighted the exceptional properties of nano-TiO2, such as high activit

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