Synthesis of 2-oxazolidinones from 2-amino alcohols using carbon dioxide in the presence of chlorostannoxane catalysts.

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Technology description

A new chemical synthetic process to yield 2-oxazolidinones that is simple, economical, and uses green chemistry

For a long time, medicinal chemists were attracted to oxazolones a class of hetrocyclic compounds because it exhibits numerous pharmacological activities. 2- Oxazolidinones is as chiral auxiliaries, which plays different roles in synthesis of several organic molecules including amino acids. It also forms derivatives which are of biological importance such as antibacterial, anticoagulant, anti-tubercular, phospholipase inhibitor, agriculture fungicide, CNS depressant, centrally acting muscle relaxants, anti-thyroid agent, antiblastic, antineoplastic and in treating urinary tract infection.

A number of synthetic processes have been developed over years and new analogues are being produced continuously to improve the biological activity of the existing derivatives. University of Arkansas at Little Rock researchers have developed a new chemical synthetic process to yield 2-oxazolidinones.This Synthetic process is simple economical and uses green chemistry. The raw materials in this synthesis are 2- amino alcohols and carbon dioxide. The research group has also identified a potential catalytic system.

Journal Publication

Synthesis of 2-Oxazolidinones by Direct Condensation of 2-Aminoalcohols with Carbon Dioxide Using Chlorostannoxanes, ACS Sustainable Chem. Eng., 2013, 1 (3), pp 309–312

Chemical Structure

Technology

Eco-friendly process.

Replaces hazardous chemicals namely, phosgene, carbon monoxide (CO).

Raw material 2-amino alcohols and carbon dioxide are readily available and economical.

Identified an efficient catalytic system 1,3-dichloro-1,1,3,3-tetraalkyldistannoxanes that has multi-active catalytic centers with controllable Lewis acidity and offers several advantages over other catalysts.

Catalyst is highly active with turnover numbers as high as 138.
It is simple one step reaction process, economically viable catalytic method.
Method results in synthesizing a broad range of OXZs with good yields.
Has short reaction time and synthesis requires mild reaction conditions.
99% pure yield by different 2-aminoethanol substrates.

Institution

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