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Green synthetic approaches for medium ring-sized and linear benzylimidazolidine oligomers

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Aminophenol-type Mannich bases are of great chemical and industrial interest due to their growing applicability for the production of new polymeric materials with excellent mechanical, thermal, photophysical, and catalytic properties. The reaction between the phenolic Mannich bases 1,3-bis[2'-hydroxybenzyl]imidazolidines and the macrocyclic aminal 1,3,6,8-tetraazatricyclo[4.4.1.13,8] dodecane (TATD) - a preformed Mannich base - was studied under solvent-free conditions. The solvent-free Mannich-type aromatic reaction between the macrocyclic aminal TATD and Mannich phenolic bases of the type 1,3-bis[2'-hydroxybenzyl]imidazolidine is a useful synthetic strategy for the high-efficiency production of medium ring-sized heterocalixarene-type compounds and linear oligomers which contains at least three benzylimidazolidine units. In addition, it was possible to get access to oligomers which could not be prepared via several different standard procedures. The 1,3-bis[2'-hydroxybenzyl]imidazolidines used were prepared by a solvent-free Mannich-type condensation between the macrocyclic aminal TATD and the appropriate phenol. Besides, macrocyclic aminal TATD was prepared and isolated in pure water in high yield and purity. The preparation of TATD in water becomes important due to environmental consideration. This is a simple method to prepare cyclic and linear oligomers in good yield and high purity under solvent-free conditions without the presence of any organic solvent or catalyst.

Biography

Augusto Rivera received his Bachelor's in Chemistry and Doctorate degree from Universidad Nacional de Colombia in 1976 and Universidad de La Laguna at Tenerife, Spain in 1979 respectively. He returned (1980) to the Universidad Nacional de Colombia where he became Full Professor. He has over 150 publications that have been cited over 800 times, and his publication H-index is 16. His research interests are in the area of N-containing medium-ring compounds, design of novel aminals, new synthetic methodologies and solid-state organic reactions.

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