## A novel mild and efficient method to prepare ε-Caprolactam, the precursor of Nylon 6

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Description

ε-caprolactam is the main precursor used for the synthesis Nylon 6; its global market have reached around 5 million metric tons per year. Synthetic polyamide Nylon 6 is of the highest importance for the textile industry and development of polymers and material science.

The production of ε-caprolactam in industry generally requires high reaction temperatures and strongly acidic media, which cause serious corrosion problems and large amount of by-products.
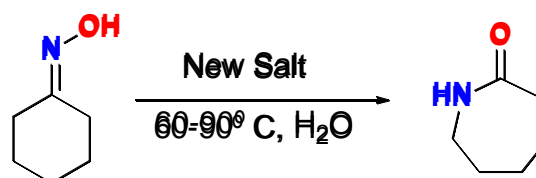
In order to solve these adverse effects, the group of Ionic Liquids of the Organic Chemistry Department has developed a new method to prepare ε-caprolactam from cyclohexanone oxime by treatment with a new salt as promoter in water. This procedure requires mild reaction conditions (60ºC or 90ºC depending on the salt concentration) and avoids the use of corrosive acids or catalyzers. The new salt is cheap, no corrosive and easy to prepare. The procedure can also be applied by using microwaves. In this case, the reaction time decreases to 10 min.

Innovative aspects and advantages

This procedure avoids the use of high temperatures or corrosive acids or catalyzers. The promoter new salt is cheap, no corrosive and easy to prepare. The reaction solvent is water, no toxic organic solvents are needed. All these characteristics makes the procedure suitable for industrial purposes.

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Commercial applications and potential users

It can be interesting to producers or users of nylon 6 (brush bristles, textile stiffeners, film coatings, synthetic leather, plastics, plasticizers, automotive paint, and cross-linking for polyurethanes).

Patent status

The procedure has been protected by Spanish patent and PCT application.

Type of collaboration

Licensing of the technology and collaboration on the commercialization of the product.

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