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Green Reagents for the Preparation of Organic Carbonates

Pyrocatecholcarbonate (PCC) as a reagent for the efficient and selective synthesis of organic carbonates on industrial scale

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IP Status

No patent

Seeking

Licensing

Background

The invention relates to a new green process for the preparation of organic carbonates, easily applicable also on industrial scale.

Organic carbonates are non-toxic and biodegradable compounds, among the most promising green candidates for the replacement of conventional noxious solvents and fuel additives, as well as for the development of innovative intermediates in the pharma, lubricant and polymer industries.

Tech Overview

The process object of the invention uses pyrocatecholcarbonate (PCC) as a reagent for the efficient and selective synthesis of organic carbonates.

PCC is used as a reagent in trans carbonation with saturated or unsaturated aliphatic alcohols, for the preparation of the corresponding organic carbonates both cyclic and linear, symmetric and asymmetric.

The new procedure overcomes the problems of the prior art, especially with regards to the toxicity of the reagents and the difficulty of management thereof, allowing the realization of a process easily applicable on an industrial scale. Furthermore, the overall process can provide for the optimized synthesis of the PCC starting from catechol and DMC (Figure 1).

Benefits

- Milder reaction conditions (in terms of temperatures, reaction times and stoichiometric ratios between reactants)
- Catalytic amount of a base
- High yields
- High selectivity
- Limited costs and production of waste

Applications

- Preparation of monomers, polymers, surfactants, plasticizers and crosslinking agents
- Candidates for replacing conventional harmful solvents and fuel additives
- Intermediate products in the pharmaceutical industry

Opportunity

Open to collaborative projects to further develop the technology and/or licensing.

Appendix 1

Figure 1