



Innovative Industrial Transesterification Catalysts

'Dual activation'

Context

Transesterification is a crucial step in several industrial processes such as the production of higher acrylates, polyethylene terephthalate, biodiesel, polylactic acid, active pharmaceutical ingredients, etc.

Catalysts used to accelerate these reactions are mainly alkali metal alkoxides or hydroxides and metal alkoxides based on Ti or Sn. In specific cases mineral acids, non-ionic bases and enzymes are used. However, these conventional catalysts suffer from a variety of drawbacks, especially if other functional groups such as unsaturated bonds, amines are present in the reactant ester or alcohol.

Technical Description

This invention is directed to a general catalyst of high activity and selectivity for the production of a variety of esters, particularly acrylate and methacrylate based esters, by a transesterification reaction.

This objective is achieved by reacting an ester of a carboxylic or a carbonic acid, in particular of a saturated or unsaturated, typically, a 3 to 4 carbon atom carboxylic acid; with an alcohol in the presence of a catalyst consisting of a metal 1,3-dicarbonyl complex and a salt, in particular an inorganic salt.

These catalysts are prepared from readily available starting materials within the reaction medium without the need for isolation (in-situ preparation).

Benefits

These catalysts have the following advantages:

- Easy preparation (mixture of two known salts)
- Inexpensive
- Selective
- High tolerance towards functional groups
- Non toxic
- Easy separation
- Reusable with no reduced activity
- Reduced tolerance towards water (no predrying necessary)

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Transesterification, Catalysis, Mixed salt

Patent :

"Transesterification process using mixed salt acetylacetonates catalysts"

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Target

- New chemical proces development
- Acrylates in chemical production and heterocyclic esters pharmaceutical process development

Further research/Extension

- Testing specific catalysator combinations on the required substrates.
- Throughput screening of catalysts.

Relevance/Opportunity

The invention is an alternative for catalysator patents and is valid for all transesterification reactions by use of an alternative catalysator which consists of iron or zinc acetylacetonate and an appropriate salt.

The invention has commercial relevance for chemical engineering and production companies due to the fact that it can replace the conventional catalysts in the transesterification steps by a novel patent protected mode.

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