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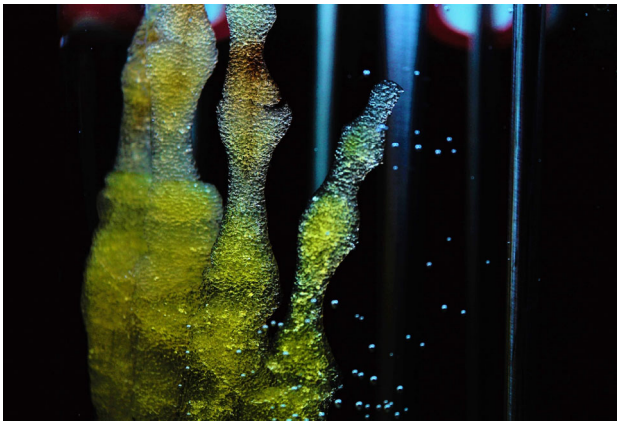
α-Ketoester as non-aromatic and non-toxic radical Photoinitiators

BACKGROUND

Photopolymerization of (meth)acrylate-based formulations has become a widespread method for industry due to the high energy efficiency and low curing times of this technology. Various products from simple coatings to more complex applications such as additive manufacturing technologies are based on this versatile method. Common industrial radical photoinitiators are generally based on aromatic ketones with the benzoyl chromophore as the key constituent. In medical or food packaging applications, residual photoinitiator or photoproducts migrating into the product have to be avoided, particularly for toxicological reasons.
Here we present a new generation of nonaromatic initiator systems. Besides their good reactivity in (meth)acrylic formulations, they show excellent bleaching properties and high biocompatibility.

FURTHER READING



Aliphatic ketoesters show high potential as Non-aromatic UV photoinitiators. Even though they exhibit lower extinction coefficients, they show similar or even better performance in (meth)acrylic systems than commercial type II benzophenone or phenyl glyoxylate initiators. Because of high solubility in organic and aqueous systems, we envisage a broad field of applications. Especially, because of the low toxicity and the biocompatibility of the initiators (ethyl pyruvate is FDA approved as food additive), this class of initiators could be used in the field of packaging of foodstuff and medical applications.

BENEFITS

- Fast curing
- Excellent Photobleaching
- Good biocompatability (some even FDA approved as food additive)
- Low cost materials
- Usage of established light sources is possible

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APPLICATIONS:
Coatings
3D Printing
Food packaging

DEVELOPMENT STATUS:
Proof of principle in lab scale

KEYWORDS:
Photoinitiator
Coatings
Food packaging
Biocompatibility

IPR:
AT granted
EP, US pending

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