Technology Offer

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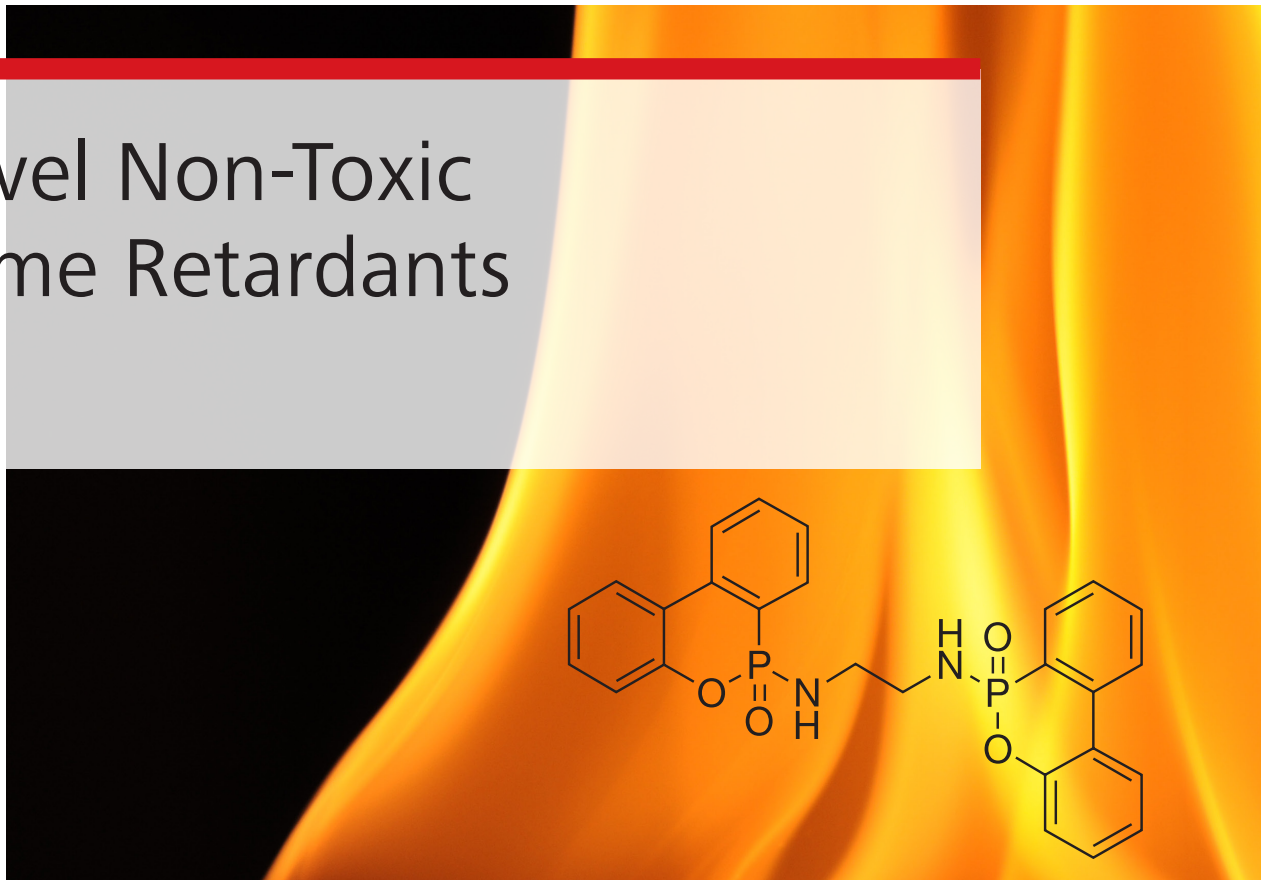
Empa
Materials Science and Technology

Novel Non-Toxic Flame Retardants



We offer novel flame retardant additives for a broad spectrum of polymers. The compounds are patented non-toxic members of the DOPO-family.

Useful for:

- **Back coatings of textiles**
- **Flame retardant PU foams**
- **Flame retardancy of plastics (bulk form, powder, etc.)**
- **Electronic devices**
- **and many other applications.**

Background

There is a huge need for non-toxic flame retardant additives due to recent regulatory changes in EU and US demanding not only non-toxicity of the flame retardant additive itself, but also non-toxicty of smoke produced from the flame retardant materials. For example the EU has banned halogenated flame-retardants in electronic devices; the recyclability of halogen containing materials is an issue.

Our compound EDA-DOPO has been tested non-toxic, is REACH registered and effective as flame retardant in may applications.

Advantages

- non-toxic
- compatible with all synthetic textiles, PU, PA, polyolefins, and epoxy resins etc.
- manufacturing established at the 1000 kg scale
- REACH registered in the EU

Proof of Concept and Evaluation

Examples: EDA-DOPO has been used as flame retardant for soft PU foam application. 5–10 wt.% of the total polyol is required to achieve a V0 rating in UL 94 horizontal burning test. EDA-DOPO can be used as a flame retardant for back coating of textiles to replace halogenated flame retardants. Typically 2–5% phosphorus content in the coating formulation is required to pass vertical burning tests.

Evaluation by Empa's partner: Empa is able to provide few kgs for evaluation.
If needed, larger quantities (> 10 kgs) can be acquired via toll manufacturer.

Expertise at Empa: Synthesis of the flame retardant, evaluation of fire performance of flame retardant materials, application of the flame retardant additive.

Applications

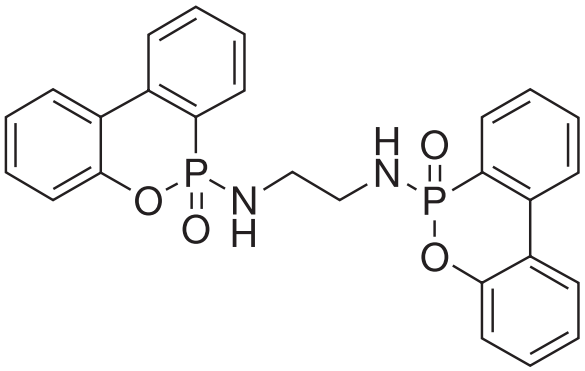
all kinds of polymers, foams, textiles, electronics, transportation, etc.

Patent Status

Patent granted in DE, UK, IT, CH, FR, ES, BE, TR, SK, RO, CA, CN, IN, KR, JP, US
WO2013/020.696 and the related patents

Keywords

flame retardant, DOPO, EDA-DOPO, polymers, textiles, additives, phosphorus



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Empa is an interdisciplinary research and service institution within the ETH Domain covering selected fields of materials science and technology development including important environmental issues. Empa's R&D activities focus on the requirements of industry and the needs of society, thus linking research to engineering, and science to industry and society. As a result, Empa is capable of providing its partners with customized services and solutions that not only enhance their innovative edge, but also help to improve the quality of life for the public at large. Safety, reliability and sustainability of materials and systems are cross-sectional topics and a hallmark of all Empa activities. As such, Empa plays a key role in Switzerland's research and innovation landscape.

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