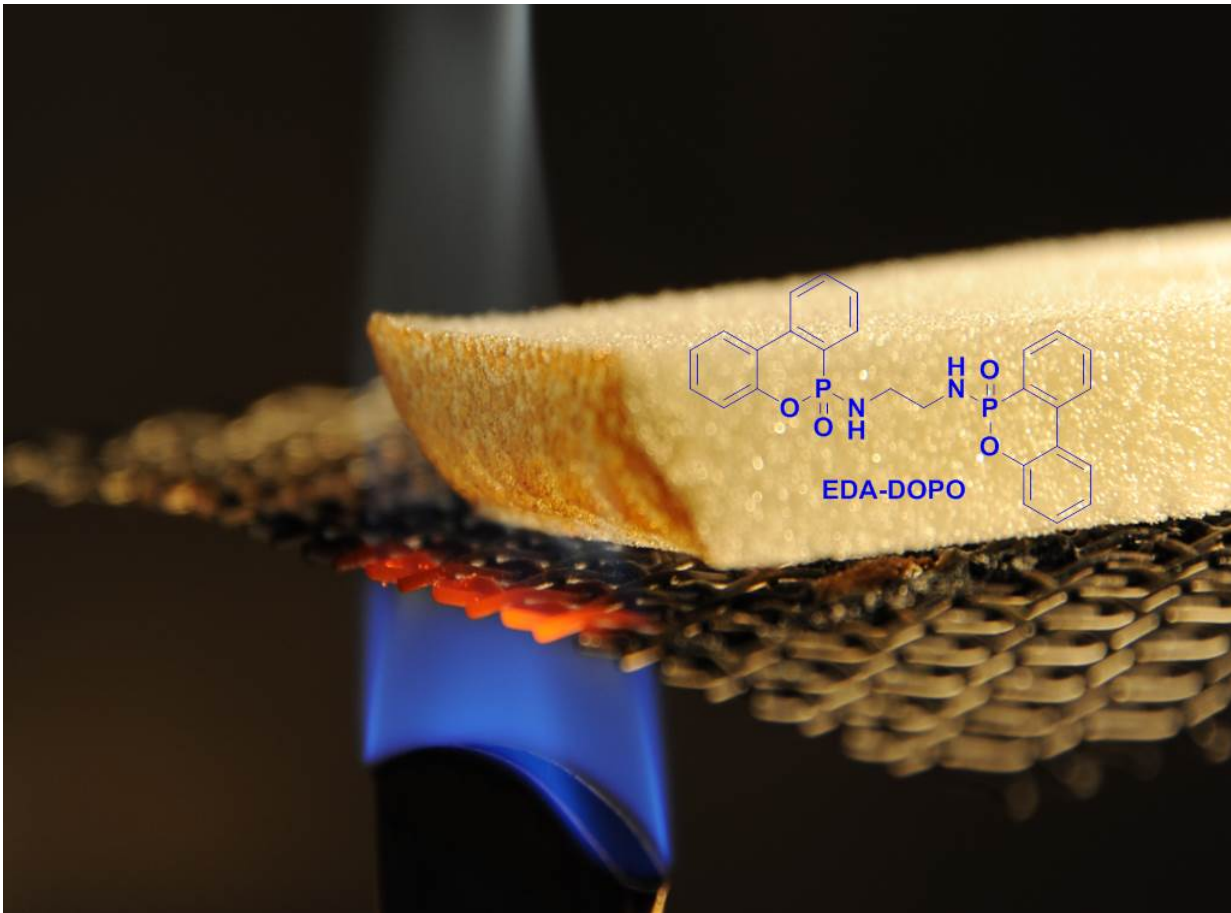


Nontoxic flame retardant enters market

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Foam sample with EDA-DOPO in a flame test in the Empa laboratory. Credit: Empa

Chemists from Empa have developed and patented an environmentally friendly way to produce flame retardants for foams that can be used in

mattresses and upholstery. Unlike previous flame retardants made of chemicals containing chlorine, the new material is nontoxic and effective. Two of Empa's industrial partners are now launching the innovation on the market.

EDA-DOPO, the environmentally friendly flame retardant developed at Empa, is going into serial production. The newly developed, particularly economic and ecological synthesis method, which also simplifies the production of other DOPO derivatives, is a crucial part of this success story. The company Metadynea Austria GmbH will manufacture the material and, if there is sufficient demand, the global FoamPartner Group will use it to produce flame-retardant polyurethane (PU) foams for upholstery and mattresses. Since the new method of production of DOPO derivatives was patented in June 2017, Metadynea Austria GmbH has already produced around 1.5 tons of the flame retardant.

Nontoxic

This constitutes the first step towards replacing conventional, halogenated flame retardants, which are sometime toxic and give off toxic gases in the event of a fire. Empa's EDA-DOPO – a derivative of the familiar flame retardant DOPO (9,10-dihydro-10-oxa-phosphaphenanthreneoxide) – does not emit these toxins. Furthermore, the foam material containing this flame retardant satisfies the highest flame retardant classification (UL 94 HB).

Fire retardant expert Sabyasachi Gaan developed EDA-DOPO at Empa in a two-year research project within the scope of the Eureka SUSPUR project (www.eurekanetwork.org/project/id/8058). It was initiated by the FoamPartner Group, which was looking to expand its range with environmentally friendly flame retardant PU foams. The company is currently the sole license holder for EDA-DOPO for PU applications. The substance is manufactured exclusively by Metadynea Austria

GmbH.

Mandatory for public areas

Flame-retardant upholstery is especially mandatory for areas where many people gather: Planes, trains, buses, hotels and restaurants. Flame retardants prevent materials from being ignited, such as with cigarettes or by vandals. However, the environmental standards keep getting stringent here, too. The evaporation of flame retardants into the ambient air or atmosphere is undesirable and the toxic gases that can form during a fire are also being accepted less and less. Many countries have already banned halogenated [flame retardants](#). Consequently, there is a growing need for modern, harmless alternatives all over the world.

Although foam production with the new flame retardant is already underway, products containing EDA-DOPO will not be on sale just yet; the flame retardant is currently being certified in accordance with the European chemical regulation REACH. The [foam](#) samples produced are presently undergoing diverse flame tests to enable the new [flame](#)-retardant foams to hit the global markets as quickly as possible once they obtain their REACH certification.

Provided by Swiss Federal Laboratories for Materials Science and Technology

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