

Nanocoating helps fight furniture fires without toxic flame retardants

May 6 2013



(Phys.org) —A thin polymer coating on foam used in furniture can prevent the spread of flames, said Dr. Jaime Grunlan, the Gulf Oil/Thomas A. Dietz Career Development Professor at Texas A&M university.

[Furniture](#) cushions are made of flammable polyurethane foam that, when burned, puddles at high temperatures, a quality called the "melt-dripping" effect that further spreads fires. Furniture foam must be treated with flame-retardant chemicals that are known to be harmful to human health and the environment. The U.S. National Fire Protection Association has estimated that upholstery and bedding were the first items ignited in an average of 17,300 fires annually, resulting in 871 civilian deaths and millions of dollars in property loss.

Grunlan said that the [coating](#) he and his research team have developed consists of a sulfur-based polymer and chitosan, a carbohydrate polymer found in crustacean shells. This new coating could be an environmentally friendly alternative to the toxic chlorine- and bromine-based flame retardants used today in furniture foam.

"This new flame retardant nanocoating functions by generating a 'gas blanket to starve the surface of burning object of oxygen," Grunlan said. "No oxygen means no fire."

Dr. Galina Laufer, a recent graduate from Grunlan's research team, published these results in *ACS Macro Letters* ("Exceptionally Flame Retardant Sulfur-based Multilayer Nanocoating for Polyurethane Prepared from Aqueous Polyelectrolyte Solutions").

Several publications, including *Chemical & Engineering News*, have reported on Grunlan's findings.

In 2012, he received the L.E. Scriven Young Investigator Award from the International Society of Coating Science and Technology "for innovative and high-impact research into coating methods and materials for barrier, [flame](#) resistance and electronic applications." He also received the 2010 Carl Dahlquist Award from the Pressure Sensitive Tape Council.

More information: [cen.acs.org/articles/91/i18/Co ... Furniture-Fires.html](http://cen.acs.org/articles/91/i18/Co...Furniture-Fires.html)

Provided by Texas A&M University

Citation: Nanocoating helps fight furniture fires without toxic flame retardants (2013, May 6)

retrieved 18 April 2024 from

<https://phys.org/news/2013-05-nanocoating-furniture-toxic-flame-retardants.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.