

Editorial

The Former BPA National Helpdesk is Now the SNA-Substitution

Dear newsletter readers,
As you may have noticed, mainly since the beginning of 2016, our website has been improving and getting broader in scope.

The “SNA-Substitution,” as it will be called moving forward, has an overall mission to supply operational support on technical topics to all economic players involved in chemical products substitution.

The activity areas and chemical products we deal with in our newsletters were originally limited to Bisphenol A only, and to its application in food packaging. These areas are about to get more diversified. We had already mentioned the BPA in our thermal papers in Newsletter #7. We will focus now on the tetraBromobisphenol A and bisphenol substitution cases.

Within the context of Action 66 of the 2014 Environmental Conference Roadmap, the French Ministry of Ecology appointed INERIS and MEDEF back in February 2016 to coordinate a work group responsible for developing a chemical products substitution guide, focusing mainly on the application on endocrine disruptors.

The website allows you to stay updated in absolute transparency on the expectations and progress of these projects through the “GT Substitution” tab, under which you’ll also be able to obtain basic documentation on substitution approaches.

This is only the beginning, and the SNA-Substitution team’s goal is to make available during the upcoming months and years additional diversified data, which focuses on technical, economic and regulatory type chemical products.

Enjoy!

For the SNA-Substitution Team
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Substitution News

DOPO to Replace BPA and BPS Derivatives Used as Flame Retardants

Tetra-Bromo Bisphenol A (TBBPA) is a bisphenol A derivative featured among bromated flame retardants mainly manufactured for their ease of implementation and attractive prices. TBBPA is mainly used as a reagent with flame retardant properties, in epoxy resin synthesis with applications almost exclusively in the electric/electronics industry (printed circuits, encapsulation of electronic parts for printed circuits, etc.) [1].

TBBPA derivatives are also used as flame retardants, among which are featured mainly: TBBPA oligomers; tetrabromobisphenol A bis (2-hydroxyethyl) ether; tetrabromobisphenol A bis allyl ether; tetrabromobisphenol A bis (2,3-dibromopropylether); and tetrabromobisphenol A bis (glycidyl ether) [1].

Among flame retardants of this family are also featured two bromated S bisphenol derivatives: tetrabromobisphenol-S (TBBPS) and terabromobisphenol-S bis (ether 2,3-dibromopropyle) (TBBPS-BDBPE) [2].

Aside from bromated components featuring an adverse toxicological profile, TBBPA and TBBPS alternatives (as well as alternatives to their respective derivatives) used as flame retardants are a possibility, for instance among epoxy resins. DOPO (9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide) seems to be the most popular alternative.

DOPO (or its derivatives) is manufactured notably in Europe by Schill Seilacher under the commercial name of Polyphlox® 3710 [3]. Let us point out, however, that the use of DOPO is incompatible with epoxy resins based on bisphenol A. Resins which contain DOPO are use in combination with metallic oxides such as aluminum trihydroxide (ATH) or aluminum oxide/hydroxide (AOH) (accounting for approximately 20 to 30% of the weight load) and at times in combination with other flame retardant additives.



Substitution News

These formulas retain adequate thermal stability, but they do present a few technical issues, e.g. high water intake, high brittleness, and a high disposal rate at the assembly stage.

For that reason, they are not suitable for battery-operated electronic appliances requiring a high level of dependability. The amount of DOPO required per resin mass unit seems to be less than that of TBBPA by approximately 10%. However, information from EFRA indicates that the DOPO overhead compared to that of TBBPA seems to be on the order of 10% [1].

Sources

- [1] *Technical possibility and economic feasibility of substitution of Tetra Bromo Bisphenol A – Report #DRC-15-142535-00175a INERIS – 2015*
- [2] <https://www.efsa.europa.eu/fr/efsajournal/pub/2634>
- [3] <http://www.struktol.net/markets-products/epoxy-resins-and-flame-retardants/flame-retardants/dopo/struktol-polyphlox-3710.html>



Substitution News

A BPS alternative among textiles

Polyamide fibers can be dyed with acid colorants [3]. In general, these dyes do not hold long enough on polyamides fibers (among them nylon fibers) and a post-treatment featuring a binding agent is often needed [1]. Frequently, the binding agent is made of anionic phenolic resin obtained by bisphenol S copolymerization (with, for instance, phenolsulfonic acid[2]).

Eurodye-ctc markets a BPS-free polyamide fiber dye fixative containing no other bisphenol, Croscolor NRF [4].

The purpose of this anionic-type fixative is to fix acid dyes on polyamid fibers, it has a polymerized benzenesulfonic hydroxyl acid base, with formaldehyde, phenol and urea.

According to its producer, this product features fixing performances higher than some resins based on bisphenol S.

The use of the Croscolor NRF fixative is not an obstacle to obtaining the OEKO-TEX® Standard 100/Class II Label (this class features textiles which touch the skin: lingerie, sheets, T-shirts, etc.).

Sources

- [1] http://ied.ineris.fr/sites/default/interactive/bref_text/breftext/francais/bref/chap_02_07.htm
- [2] http://www.konishi-chem.co.jp/technology_e/phenol.html
- [3] <http://www.sarex.com/sarexnew/textile/articles/pdf/ART139.pdf>
- [4] http://www.uniteks.org/en/images/eurodyc/Product_information_complete.pdf



Events

TEX WORLD Tradeshow: September 12-15, 2016 in Paris (France)

In the context of this international tradeshow, a conference will be held focusing on the identification and suppression of supply chains featuring textiles made of undesirable substances such as substances which are a potential health or environmental hazard. Moreover, this tradeshow makes some information on the ecological textile theme available to visitors.

<http://texworld.messefrankfurt.com/paris/fr/visitors/welcome.html>

ENOVA Tradeshow: September 14-15, 2016 in Paris (France)

During this two-day technologies and services tradeshow, manufacturers, suppliers and distributors in the electronic, measurements and optical industry will be able to mingle.

<http://www.enova-event.com/>