

**BPA NEWS****BPA REPLACEMENT NEWS**

The INRA and Montpellier ENSCM are leading research on a new method which does not use Bisphenol A in epoxide resin synthesis, but rather uses bisourced tannins. Additionally, this method also allows the replacement of epichlorohydrine (a substance classified as cancerous) by an enzyme at resin synthesis.

Source: <http://departements.inra.fr/deptunite23/Le-departement-Les-recherches/Nos-resultats/resine-epoxy/%28key%29/71>

Biosourced polyester extracted from tomato skins was studied within the framework of the European project BIOCOPAC, in view of developing a replacement for BPA-based epoxy resins.

Source: <http://www.biocopac.eu/en/>

The American company Novomer offers polypropylene carbonate (PPC) polyol on the North American market, a thermoplastic polymer synthesized at close to 50% from CO₂. PPC can also be combined to modified starch to form a polymer composite called "starch-PPC", which can be used in packaging. To develop this product, Novomer joined forces with the starch producer Penford Corp. Currently in development phase to replace epoxy resin in drink cans and canned goods in the USA, the composite could also be imported into Europe. This material is also being tested for the manufacture of "doypack" (a multi-layer flexible pocket able to stand vertically). In February 2013, NOVOMER announced its first production of 7 tons of polypropylene carbonate (PPC) polyol.

Sources:

http://www.novomer.com/?action=pressrelease&article_id=56
http://www.greenerpackage.com/bioplastics/novomer_and_penford_partner_develop_sustainable_packaging_materials

DURABIO is a biosourced polycarbonate which uses isosorbide as its base monomer. This biopolymer can replace BPA-based polycarbonate in several applications, and is currently in development for food contact applications. Though non-biodegradable, it displays better resistance to abrasion, increased transparency and better light stability compared to BPA-based polycarbonate. On the other hand,

its cost is superior to that of classic polycarbonate, and it offers less resistance to temperature. Its impact resistance is similar, and possibly slightly inferior, to that of polycarbonate. Durabio is currently marketed and made available in Europe by Mitsubishi Chemicals. The company wants to increase its production of DURABIO from 5,000 t in 2013 to 16,000 t in 2014, then to 20,000 t in 2015.

Sources: <http://greenchemicalsblog.com/2013/05/10/7025/>
http://www.m-kagaku.co.jp/english/products/business/polymer/sustainable/details/1191454_3255.html

A new technology held by Empire Technology Development LLC allows it to offer tetradecahydroanthracene-based polymers (TDHA) as an alternative to BPA-based polymers. TDHA-based polymers can be prepared by anthracene hydrogenation. Two synthetic routes exist to form a TDHA-based polymer: either anthracene-based monomer hydrogenation before polymerization, or anthracene-based polymer hydrogenation with or without catalyst. Thereafter, the epoxy resin synthesis of TDHA is similar to that of those containing BPA. For example, low-molecular-weight epoxides can be prepared through the reaction between TDHA-9, 10-diol and epichlorohydrin. Two patents were filed in 2012, and the product could be made available in Europe, market conditions permitting. This resin is currently in testing phase. In their patent, the inventors of the technology (Dr. Brenden Carlson¹ and Dr. Gregory Phelan²) present TDHA monomer as having low toxicity, and affirm that the material should be a cheap alternative in comparison to BPA-based polymers.

Sources: <http://www.google.com/patents/US8227561>
<http://www.google.com/patents/US8329846>

¹Dr. Brenden Carlson is an Associate Professor at Washington University, USA.

²Dr. Gregory Phelan is an Associate Professor at State University of New York in Cortland, USA.

Agenda**Eighth European conference on bioplastics.**

December 2013. Germany. <http://en.european-bioplastics.org/conference/>

Mideast 2013. Industrial outsourcing exhibition.

November 2013. Paris. <http://www.midest.com/>

Plant based summit. Biosourced solutions exhibition.

November 2013. Paris. <http://plantbasedsummit.com/>



Online survey

The survey conducted by INERIS regarding Bisphenol A use in thermal papers (cash tickets, etc.), and available alternatives, was finalized in October of this year. It is however still possible to add your contribution by reporting your interest by email (survey@ineris.fr) until December 31, 2013. This survey follows the announcement made by MEDDE, regarding its intention to propose, within the framework of REACH, a restriction throughout Europe on the use of BPA in thermal papers.

Case File

Carton packaging or metal box?

Food cartons represent a serious competitor for food cans. Two manufacturers of carton packaging (SIG Combibloc and Tetra Pak) offer products developed specifically for aseptic foods.

For example, Tetra Recart® (Tetra Pak) and Combifit® (SIG Combibloc) packaging are BPA and phthalates free and made of a multi-layer material composed of, amongst other, carton and aluminum, the internal layer in contact with food being of polypropylene.

These packages are very common in England and Italy where 20% of dry aseptic vegetables are in carton packaging (figures from Tetra Pak 2012), and also in Sweden where 20% of aseptic tomatoes are in carton packaging (figures from Tetra Pak 2012). Currently, it is mainly private-label distributors positioning themselves on core market sectors (mid-range) that use this kind of packaging, but the other brands are beginning to use this packaging also (for example: Liebig, Knorr, Blédina, Nestlé, Hipp, etc.) So far no packaging chain has been present in France as this solution has not yet been developed there. It is thus currently required to outsource the packaging phase to Italy or Spain. On the other hand, the additional cost associated potentially with the price of materials and a more distant packaging could likely be offset by optimizing the logistic phase of the empty packaging (light weight and minimal clutter of the folded packaging), and of the full packaging (the parallelepipedic shape allowing optimal storage).

Casino distribution group (<http://www.ineris.fr/substitution-bpa/node/125>) implemented a range of chunky soups in 2012

which followed a range of tomatoes in 2011, both of which used carton packaging. Tetra Pak announces the imminent arrival (before end 2013) of a new participant on the market of aseptic food items packaged in Tetra Recart® carton, its identity remains confidential for the time being.

In regards to the environmental aspect, life cycle analysis of carton packaging (<http://www.alliance-carton-nature.org/node/236/analyse-de-cycle-de-vie>) shows, according to its promoters, that its use results in lesser emissions of CO2 than other aseptic food packaging (metal box, doypack, glass jar). "The recycling line of food cartons is integrated in the paper and cardboard line" says Baptiste Naegelen, Tetra Recart® product line manager at Tetra Pak. "So far, 45% of food cartons are recycled. Once in the sorting center, cartons are forwarded to paper recyclers where a separation of the different materials is carried out. The carton is recovered to manufacture paper towels, toilet paper or boxes of tissue. The residue consists of an amalgam of aluminum/polypropylene which will be used to make vine stakes, office materials or public benches. There exists another technology in Barcelona that separates the aluminum from the polypropylene through pyrolysis, thus obtaining reusable aluminum ingots."

In 2013, the IFOP directed a survey on behalf of Alliance Carton Nature (Natural Carton Alliance) for the fourth consecutive year (<http://www.alliance-carton-nature.org/les-fran%C3%A7ais-et-les-emballages-de-produits-alimentaires-etude-acn-ifop-2013>), the objective of which was to evaluate the environmental perception of French consumers pertaining to food products packaging. Results of the survey indicate that recycling is a key leverage factor of the environmental approach and that a powerful ecological dimension is associated with carton food packaging.

According to Olivier Draulette of SNFBM (National federation of manufacturers of boxes, packaging and metal closures for foodstuffs), carton is less favorable to recycling as it can only be reused once either in toilet paper or paper towels, unlike the steel used in canned goods which can be recycled indefinitely. Therefore, according to him, food cartons should not be considered a solution to the increase of final waste. Additionally, the best before date is only 2 years for carton compared to 5 years for the metal box.

See also: <http://www.ineris.fr/substitution-bpa/FAQ>