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Research area: Product aims

Paper, paperboard and board // Packaging papers and paperboard

Key words:

Packaging, mineral oil, benzophenone, bisphenol A, phthalates, migration, coating, sorption

TITLE:**Preventing the migration of critical substances by using sorption-capable substances in the coating layer of paper-based packaging****Background/Problem area**

According to information from the European Food Safety Authority (EFSA), the Federal Institute for Risk Assessment (BfR) and investigations conducted by the official food monitoring authority in the Canton of Zurich, packaging materials of paper may contain critical substances such as benzophenone, bisphenol A, phthalates and mineral oil in amounts of as much as 1000 mg/kg. These critical substances originate from UV Printing inks and varnishes (benzophenone is used as a photoinitiator), adhesives and varnishes (phthalates are used as softeners), printing inks (mineral oils) and recovered paper. In view of the high recycling rates in Europe (74.6% for packaging materials according to the CEPI Key Statistics 2009), these substances can also be found in food packaging. These significantly impair the product quality of food products. In the worst case, the ADI (acceptable daily intake) value of these substances may be exceeded. It is therefore important to ensure that these substances do not migrate into the food. One possibility is to use sorption materials such as zeolites or cyclodextrins that are integrated into the product-side coating.

Objectives/Research results

The objective of the project is to develop concepts for incorporating sorption materials into coating colour formulations that can selectively sorb benzophenone, bisphenol A, phthalates and mineral oil out of paints, varnishes, adhesives and recovered paper, thus preventing the contamination of food due to the release of these substances.

An extensive test programme was designed to analyse variations in the sorption materials (type, amount, etc.) and variations in the coating colour formulations (pigments, binders, additives) as well as variations in coat thickness, coat weight and the type of application. The coating colour formulations produced are to be applied as a reference substrate, and the functionality are to be determined by means of migration tests, among other things. The thus optimised coating colour formulations are to be used on mill paper and their recyclability is to be tested as well. The economic feasibility shall conclude the study.

Application/Economic benefits

The anticipated project results are beneficial for the entire added value chain. The latter comprises: manufacturers of packaging paper, manufacturers of chemical raw materials and additives, paper converters and packaging manufacturers, packagers and end-users. It is in the sector of suppliers and paper converters above all that the share of SMEs is high. The technical and economic benefits arise from the following facts:

- savings compared to virgin fibre paper and board (paper industry)
- savings in the development costs of optimised food packaging containing recovered paper (paper industry)
- additional revenues due to better marketing and new sales markets (suppliers)
- avoidance of higher costs due to virgin fibre packaging (paper converters)
- increasing market shares due to improved consumer protection (packagers)

In view of the greater consumer and health protection, there will also be benefits from increased public image for all participating companies. This enhanced image can in turn result in improved marketing and thus to an increase in market shares.

Period of time: 01.05.2012 – 30.10.2014

Remarks:

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