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Research and development in the field of foamed bioplastics

Today, foam extrusion of thermoplastics such as polyethylene (PE), polypropylene (PP) or polystyrene (PS) is widely used to produce foamed products, e. g. food packaging trays or insulation boards. However, there is an increasing demand in considering sustainability aspects (e. g. low toxicity, renewable resource base) for materials and products. Therefore, considerable research has been conducted on foaming bio-based plastics recently. The contribution gives an overview of the developments at Fraunhofer UMSICHT in the field of biopolymer foams. Recent results of foaming of different biopolymers, namely starch, cellulose esters, bio-based polyesters and a bio-

based polycarbonate, will be presented. The research covered chemical as well as physical blowing agents. Morphology was analyzed by means of optical microscopy and scanning electron microscopy. Physical foam properties such as foam density and porosity as well as mechanical foam properties were also measured. Depending on the biopolymer type and the blowing agent type and content, different foam properties and foam morphologies can be achieved. Finally, an outlook on future research projects of Fraunhofer UMSICHT in the field of biopolymers foaming will be given.

Biography

Stephan Kabasci holds a PhD in Chemical engineering from the Technical University of Dortmund. He has been working for Fraunhofer UMSICHT since 1992, starting as a research engineer and project manager. From 1998 – 2003 he was head of the working group "Bioengineering", 2004 – 2013 he was business unit manager "Renewable Resources, and since 2014 he has been head of the department "Bio-based Plastics". He is teaching bioengineering at the Ruhr-University Bochum and he is the editor of "Bio-based Plastics. Materials and Applications" in the Wiley Series on Renewable Resources.

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