

Natural flame retardants based on phytic acid for the textile and plastics processing industry

Halogen-containing flame retardants for the textile and plastics processing industry are ecologically questionable and are considered to be highly hazardous to health. For this reason, substitute solutions have been sought for many years. Phosphorus and nitrogen compounds are suitable alternatives, but so far these have not been of natural origin. Phytic acid, on the other hand, is a natural source of phosphorus that can be obtained, for example, by extraction from wheat bran and oilseeds and their residues. DTNW has already shown that phytic acid in combination with nitrogen-containing polymers is suitable for flame retardant finishing of textiles. However, the layer-by-layer process demonstrated so far is multi-step and too expensive for commercial application. Therefore, the aim of the present research project is to develop a one-step coating process for textiles. At the same time, the natural P/N-containing flame retardants are also to be used by the project partner UMSICHT in the extrusion of different plastics such as polypropylene, polyester or bio-based PLA. In this context, stable, water-insoluble complexes with phytic acid are to be formed with different synthetic and natural polyelectrolytes, which are immobilized on and in different textile and non-textile substrates via coating and incorporation processes in order to impart flame-resistant properties to the materials treated in this way. The R&D project addresses small and medium-sized textile manufacturers and textile finishers, manufacturers and finishers of leather and artificial leather, manufacturers of textile auxiliaries, the chemical industry, and the plastics processing industry, especially for electrical/electronic products and the construction industry. The use of bio-based flame retardants opens up new market segments for users in the above-mentioned industries with articles from sustainable production



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