

PROCESS FOR THERMAL TREATMENT TO FORM CELLULOSE CARBAMATE

Scientists from Innsbruck University, Austria succeeded in identifying a new non-toxic and highly efficient method for introducing carbamate groups to cellulosic materials.

Background

Cellulose carbamate (CC), an ester of cellulose and carbamic acid is conventionally produced by heating, cellulose at high temperatures in the presence of ammonia derivatives, such as urea, thus forming the alkali-soluble CC. The substance, an interesting alternative to petroleum-based polymers can be processed to form fibres, foils, sponges, membranes, and other products. In conventional processes, CC is produced by reaction of cellulose with urea in alkali, organic solvents or liquid ammonia with or without the presence of catalysts. Alternative production technologies are known where the reaction requires microwave treatment, electron radiation, or supercritical carbon dioxide. These processes, however, are time intensive and require a high consumption of chemicals.

Technology

The novel technology allows for a solvent – and radiation-free production of CC. Carbamate groups are introduced to cellulosic materials by using only non-toxic and environmentally friendly chemicals. The total processing time is reduced by 50 – 90%, thus, increasing the process efficiency. All residues can be removed easily.

Benefits

- Solvent-free and no radiation required
- No environmental (air and water) pollution
- Reduced chemicals and time consumption
- Easy and flexible production - can be applied on all types of raw materials (pulp, fibres, films, paper, fabrics)
- Benefits of biodegradation, built-in antimicrobial activity, and high water absorbance properties of cellulose carbamate

Status of the Technology

Early stage of development

Application

- Fibre/ film/ membrane/ sponge or related industry
- Paper converter industry
- Nonwoven industry

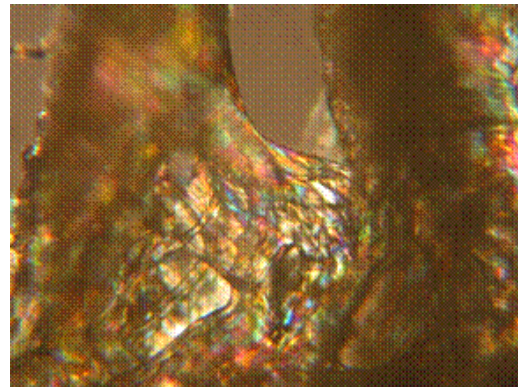


Figure: Thermally treated cellulose carbamate fibre

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IP Position

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Licensing conditions

Application specific exclusive or non-exclusive license

Cooperation Options

Development cooperation

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