

SHAPE MEMORY BEHAVIOR OF BIO-BASED FIBERS AND THEIR APPLICATIONS

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Natural bio-based fibers consist of a large amount of hydrogen bonds between intra and inter macromolecules that offer a basis for switch required in shape memory behaviors. This work reports our advance in understanding the bio-based fibers with shape memory in keratin hairs, β -sheeted filaments, chitosan and collagen fibers. Qualitative and quantitative study of such fibers was carried out in terms of their structure, shape fixation and recoverability under cyclic deformation programming. The effects of hydration on recovery dynamic mechanical behaviors and structural components were all systematically studied. Hybrid structural network models with switch net points will be presented for interpreting the shape memory mechanism of bio-based fibers. This kind of discoveries of bio-based fibers is surely expected to provide inspiration for exploring other natural materials to reveal their smart functions and making more remarkable synthetic smart materials as well as widening the applications of existing materials



Biography

Jinlian Hu has received her PhD from the University of Manchester in 1994 and then immediately became a Faculty Member of the Hong Kong Polytechnic University. She has achieved international reputation for her insight in conventional and emerging research areas, particularly shape memory polymers and textiles. She has approximately 500 publications including 12 books with 7 related to smart polymers, particularly shape memory polymers. She has about 40 granted patents and wide connections with industries. She is frequently invited Keynote/Plenary Speaker at different conferences. She has received over 50 awards including Distinguished Achievement in Fiber Science from the US-based Fiber Society and the Gold Award, two times on the Advanced Automatic Fabric Appearance Evaluation Systems by National Inventions Exhibition of China and First prize of Sang Ma Trust Fund Textile Science and Technology Award. In 2011, she was awarded the title of China Textile Academic Leader by the China Textile Engineering Society. She is also the recipient of China Elite Talent in 2012.

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