

# A Study on the Composite Fabrication of Nano-Fibrillated Copolymerized Aramid Fiber and Shape Memory Polymer

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## Abstract

Copolymerized aramid is a copolymer of meta and para-aramid. By imparting the flexibility of meta-aramid to para-aramid, the mechanical properties and processability were increased. If the copolymerized aramid fibers are nano-fibrillated and combined with a polymer resin, the high-performance composite can be prepared, effectively. In this study, nano-fibrillation method of copolymerized aramid fibers was studied and suggested. The nano-fibrillation of the copolymerized aramid fibers was carried out by a chemical method using KOH solution. The shape memory polymer was used as a binder matrix and the solution mixing method was utilized to prepare the composites with nanofiber content. Surface morphology of the composite was investigated by using SEM, and thermal properties were analyzed by using TGA. The mechanical properties of the composites were compared with processing conditions. Finally, the shape memory nature of the composite will be investigated and discussed.

**Keywords:** copolymer, aramid, shape-memory, composite, polymer