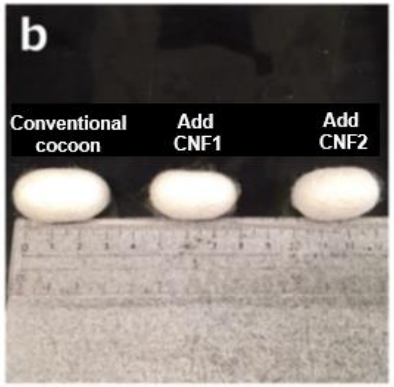
Tohoku Univ. Technology

Silk thread with dispersion reinforced cellulose nanofibers

Realization of silk thread with uniformly dispersed CNF!
Increased mechanical strength by feeding techniques!!

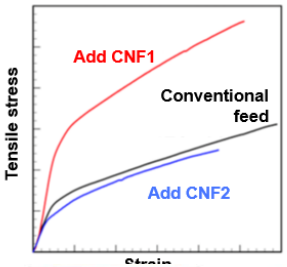


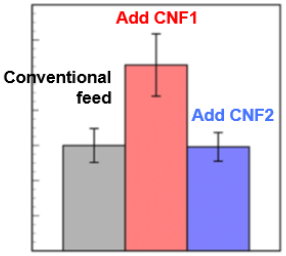
Overview

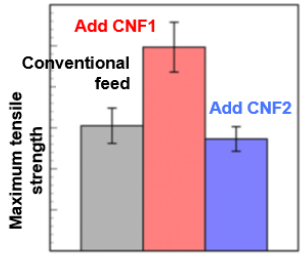
Recently, cellulose nanofiber (CNF) has attracted attention as a new material. Although it is expected to be used as a filler to improve mechanical strength by dispersing CNF into a base material such as resin, it is still a problem because of insufficient orientation and dispersability in the base material.

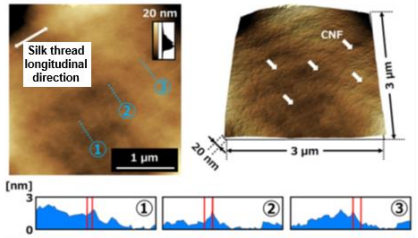
The present invention has been made in view of such problems. Focusing on silk fibers as a base material, we have succeeded in providing a technique for obtaining silkworm silk obtained by uniformly dispersing CNF.

Features･Outstandings









Upper :
x1.5 to x2.0 increase of Young's modulus and tensile strength

Left :
Uniformly dispersed CNF at nano-level

Product Application

- Possible to create composite material with this silk thread and resin, etc.
- 100% naturally derived material with extremely low environmental impact
- 2 possibilities of usage : continuous fibers and short fibers

Related Works

[1] C. Wu, S. Egawa, T. Kanno, H. Kurita, Z. Wang, E. Iida and F. Narita, Nanocellulose Reinforced Silkworm Silk Fibers for Application to Biodegradable Polymers, Materials & Design 202 (2021) 109537.

IP Data

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