

NANO TENSILE TESTING DEVICE

This novel, patent pending nano tensile testing device allows the quantitative and qualitative investigation of viscoelastic material properties of nano- and microfibers (e.g. collagen fibrils) in large quantities and in different media. The force sensor can be used again immediately after a test has been completed, thus significantly increasing the accuracy of the measurements, as well as the throughput to at least 50 samples per week.

BACKGROUND

With Atomic Force Microscope (AFM) any kind of sample can be analyzed, e.g. polymers, adsorbed molecules, films or fibers and powders in air or liquid. However, the most common method currently used to perform tensile tests on nano- to microscale fibers only allows a maximum of two samples per week. Other methods achieve a throughput of 4-5 samples per week, but have further limitations, which makes dynamic and force-controlled measurement with high precision impossible at present.

The new method allows fast coupling and uncoupling of nanoscale fibers and thus an increase in the number of tensile tests by at least a factor of 20, making a quantitatively relevant measurement of the tensile mechanics of collagen fibrils possible for the first time.

In general, any indentation measuring device could be equipped with the presented invention in order to scientifically test material characterization or the effectiveness of new products: e.g. collagen fibrils synthetic and natural nanofibers, such as cellulose fibers, silk, viscose natural and synthetic fibers.

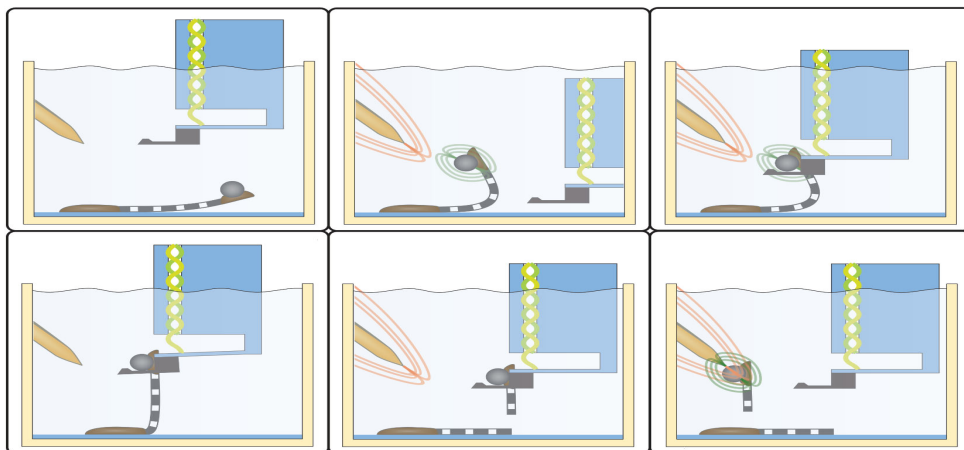


Fig 1: Tensile testing device – pick up

ADVANTAGES

- Conducting tensile tests in large numbers (>50/week)
- Suitable for testing in different media - even liquids
- Immediate re-use of the force sensor
- Reproducibility increased
- More defined pick up of fibril
- Retrofittable for use with all indentation measuring devices
- Determination of mechanical properties of microstructures
- Material characterization of polymers and hydrogels
- Analysis of material for vascular substitute material

REFERENCE:
M011/2020

APPLICATION:

Applications include material sciences, life sciences, semiconductors and electronics and others, e.g. solar cells, geosciences, forensic sciences, food technology; academic institutions and research institutes.

DEVELOPMENT STATUS:
TRL 3, Proof of concept

KEYWORDS:

nanofibre material testing,
collagen fibrils, tensile test

IPR:

Patent AT and PCT filed

OPTIONS:

- R&D - Cooperation
- License Agreement

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