

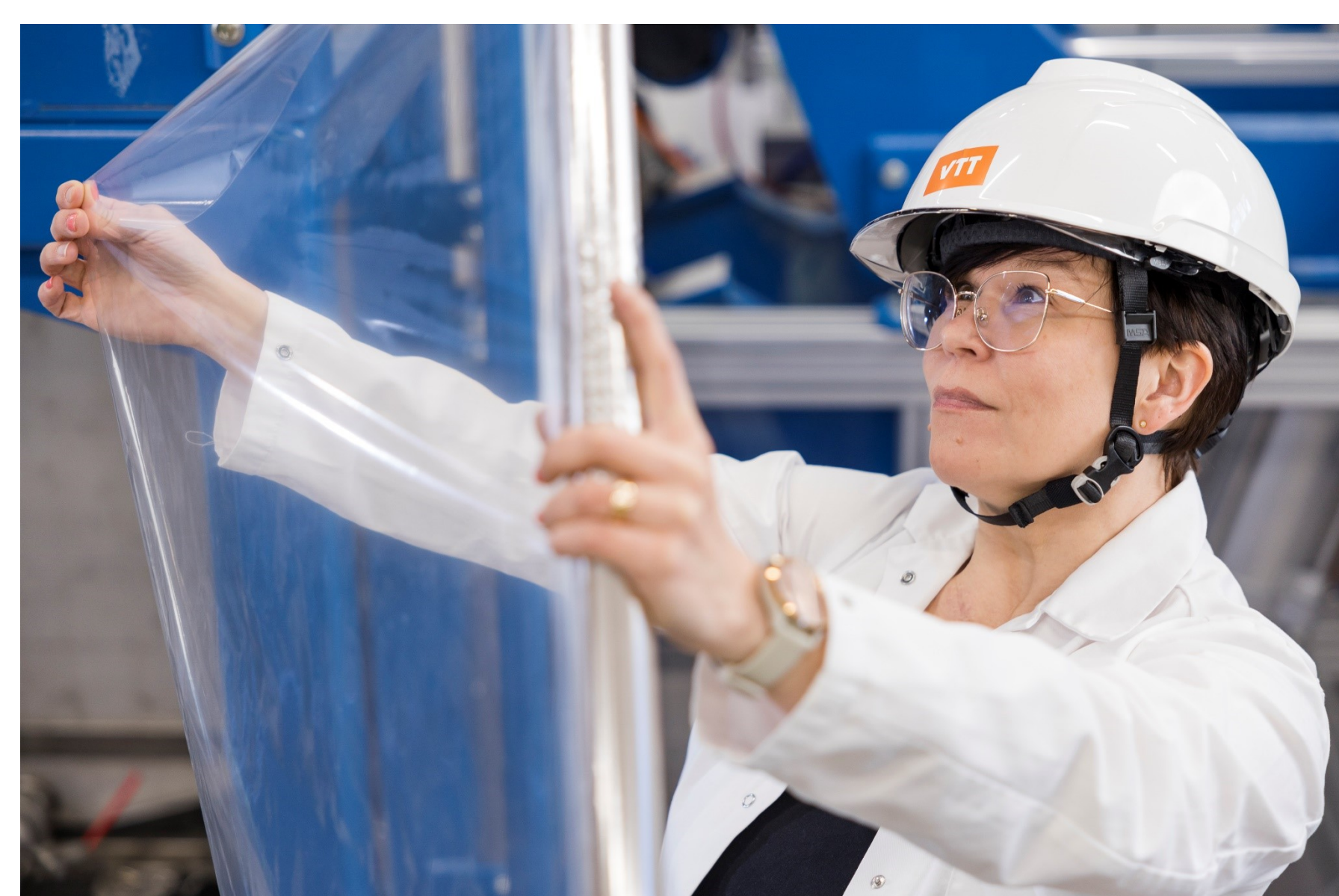
Novel Transparent Cellulose Film in Food Packaging

Poster 08-04

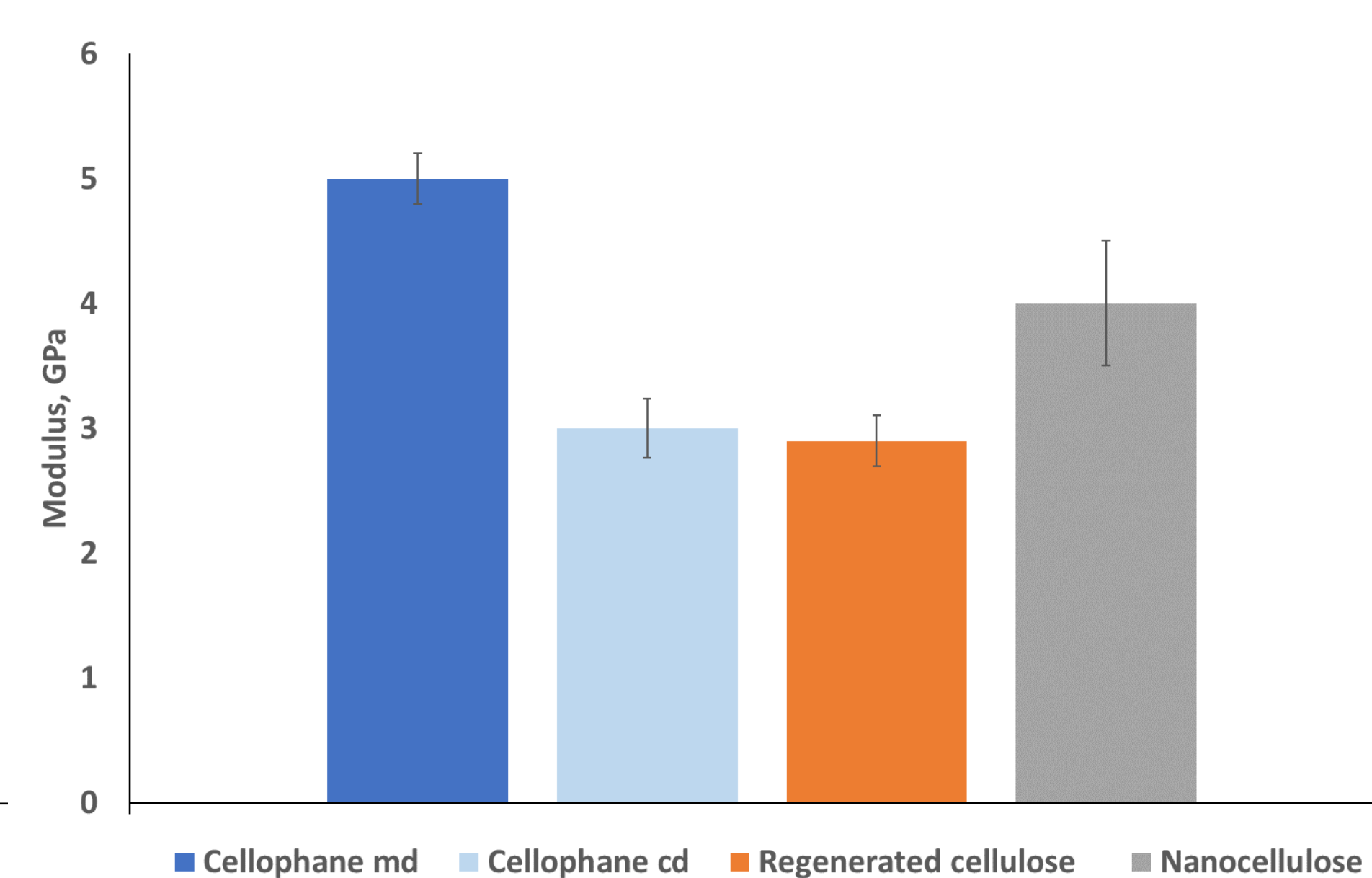
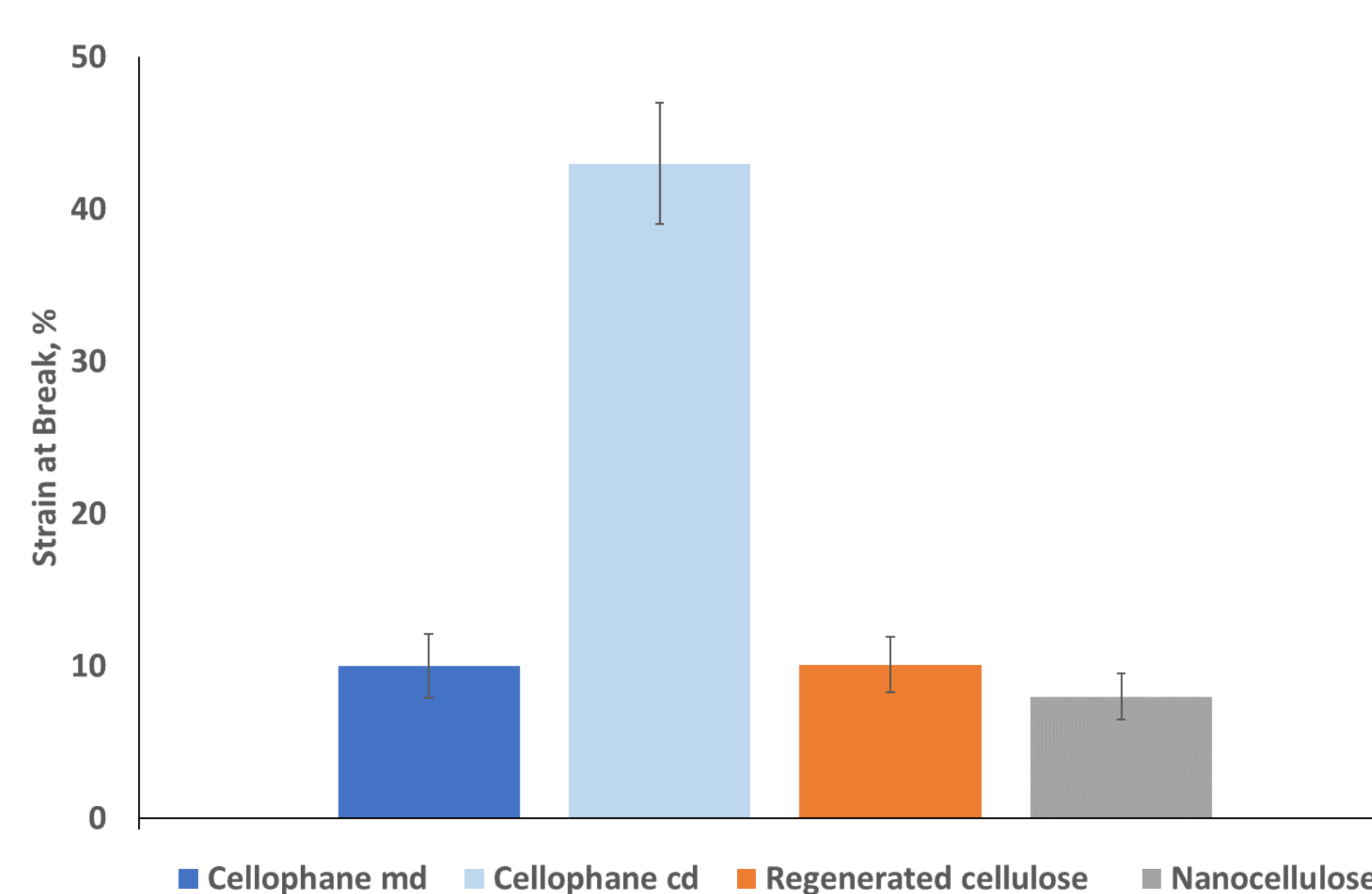
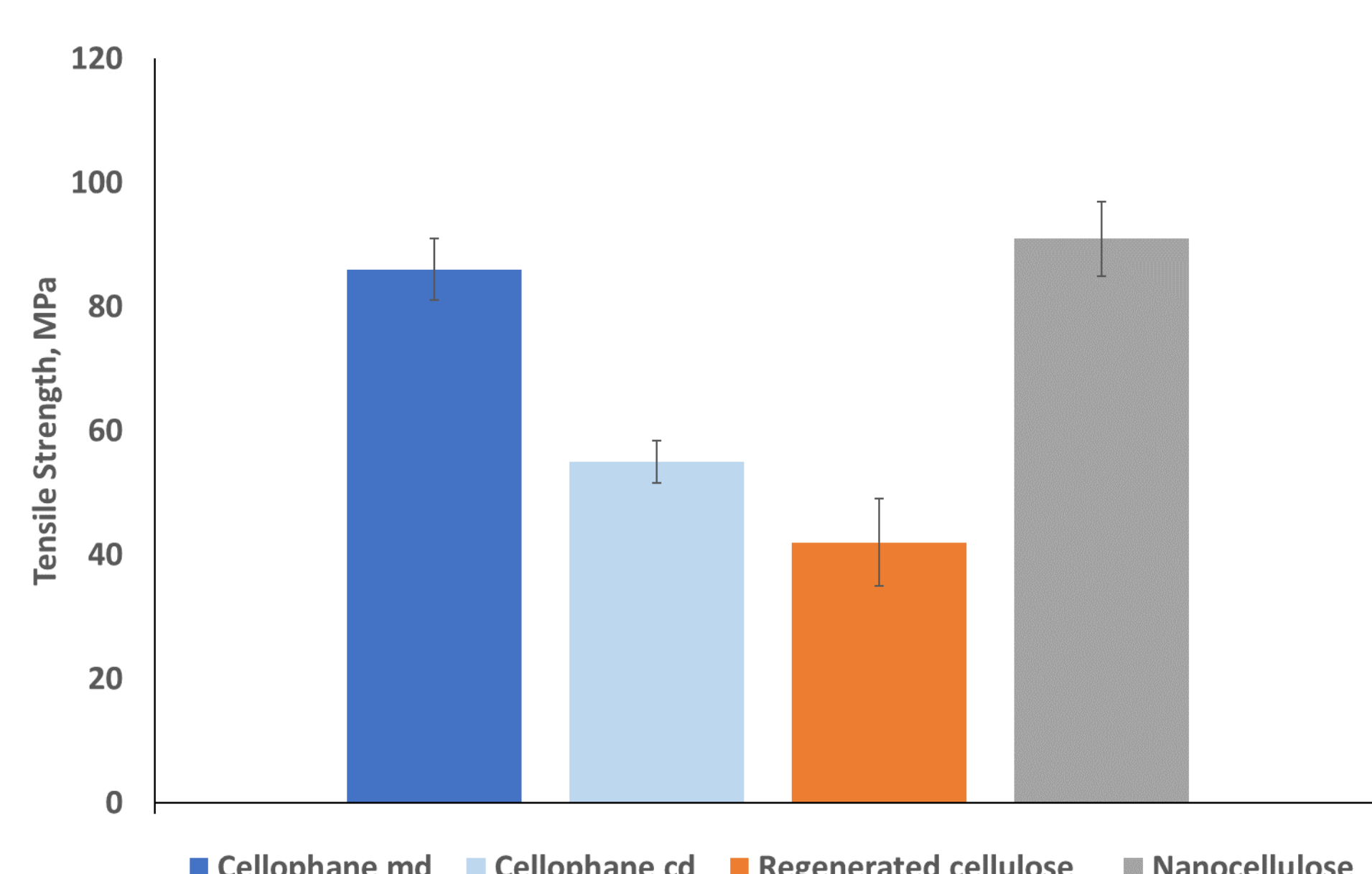
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The demand to reduce dependency on fossil carbon as a raw material together with environmental concerns have led to research on finding alternatives for plastics. In addition, legislation limits the use of certain single-use plastic materials. These factors have been the motivation for development of novel technology for producing transparent cellulose films suitable for various food packaging applications. Previously, VTT has also introduced several innovative packaging films from fibrillated cellulose, novel thermoplastic cellulose and combinations of these.

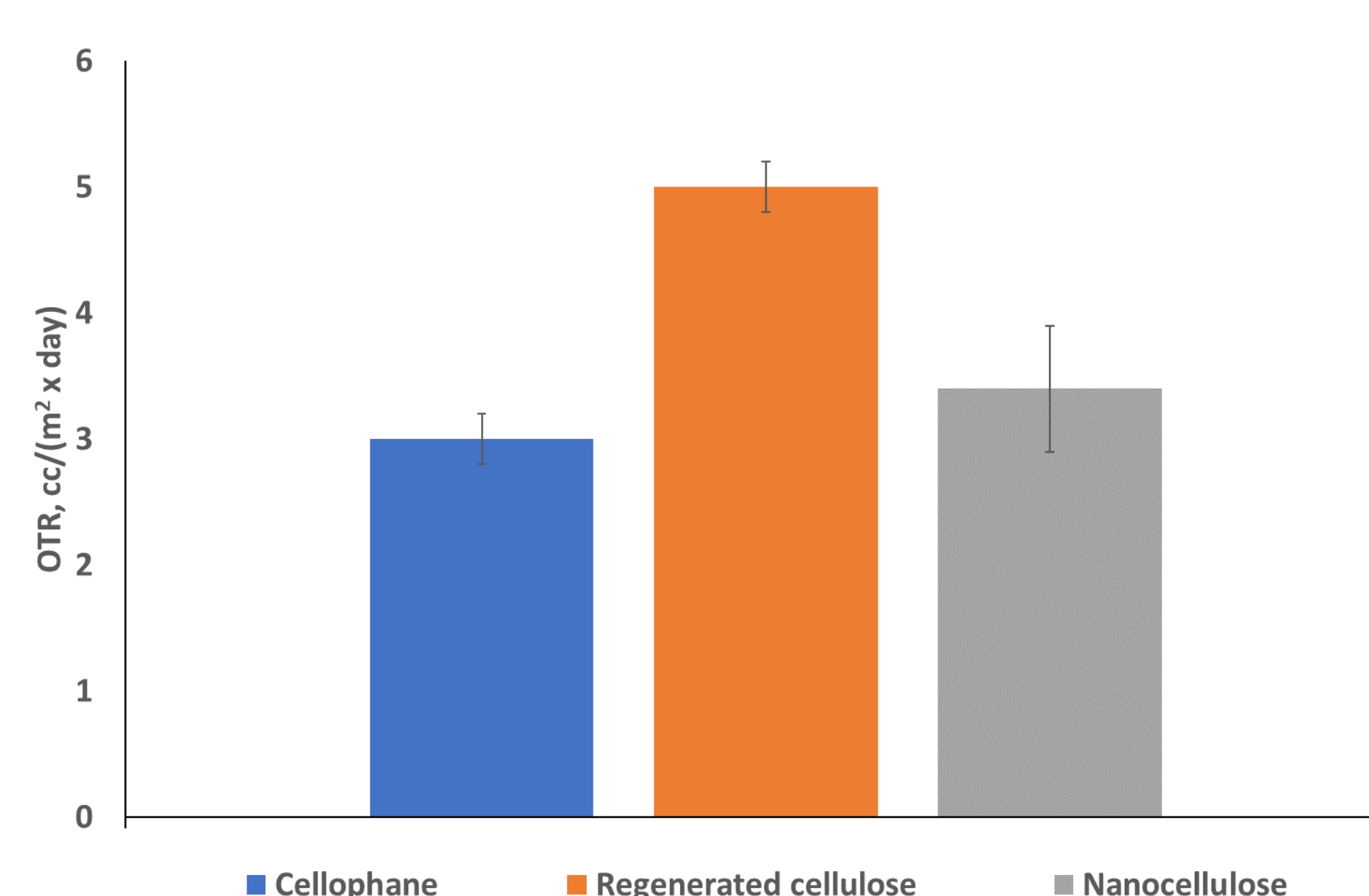
The novel technology is based on alternative dissolving and regeneration technology that is more environmentally friendly compared to cellophane production. The technology applies improved rheology control enabling enhanced film properties and more freedom for raw material selection and recyclability. VTT has launched a major material and application development project and pilot equipment for technology demonstration in Bioruukki piloting center in Espoo, Finland.



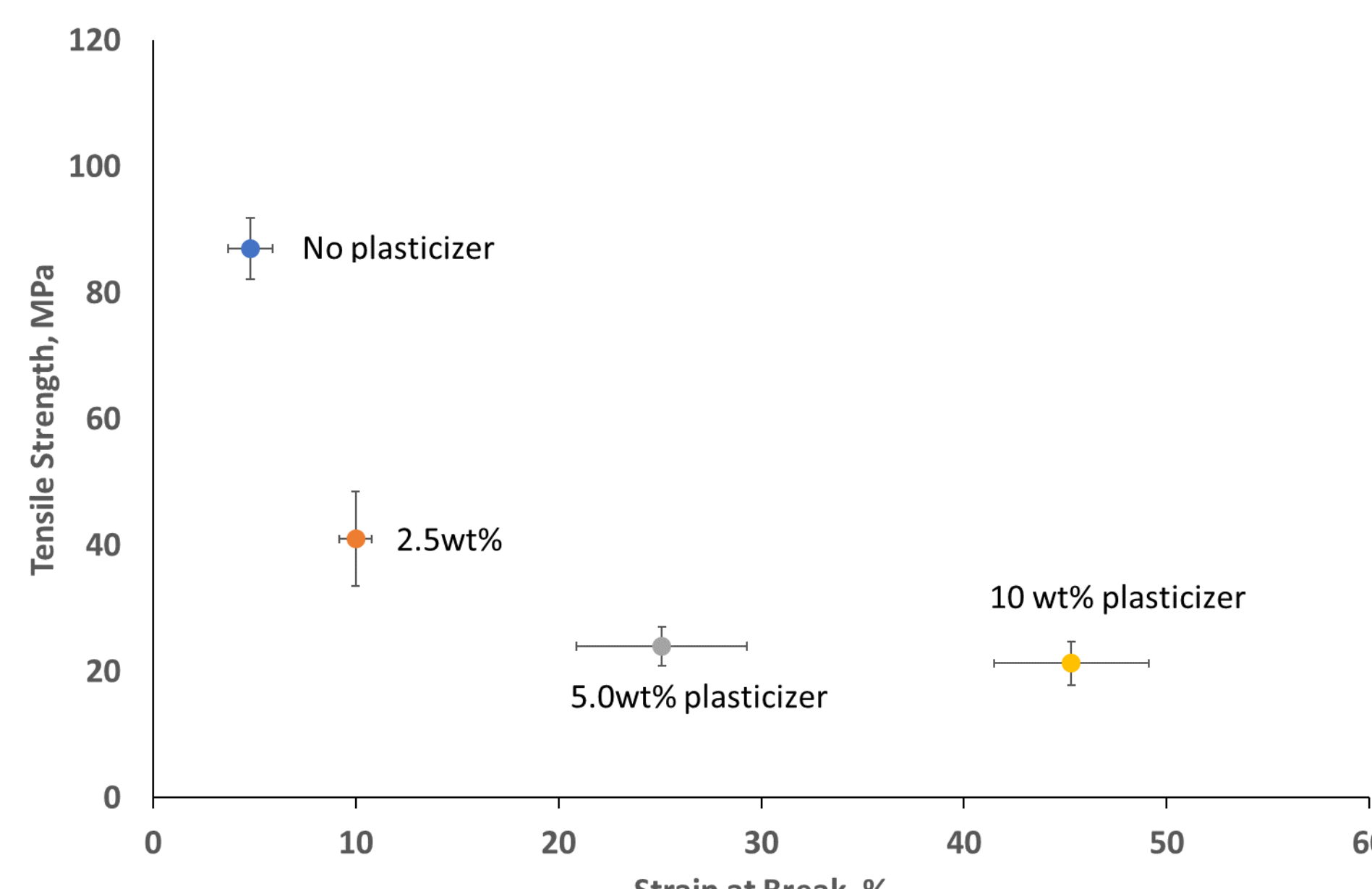
Cellulose films manufacturing line built for technology demonstration. Equipment is designed to produce self-standing regenerated films from cellulose dissolved using various chemistries. Modular concept of the pilot line provides options to partially dissolve fiber webs, in-line impregnation and coating of paper and carton board with the regenerated cellulose film.



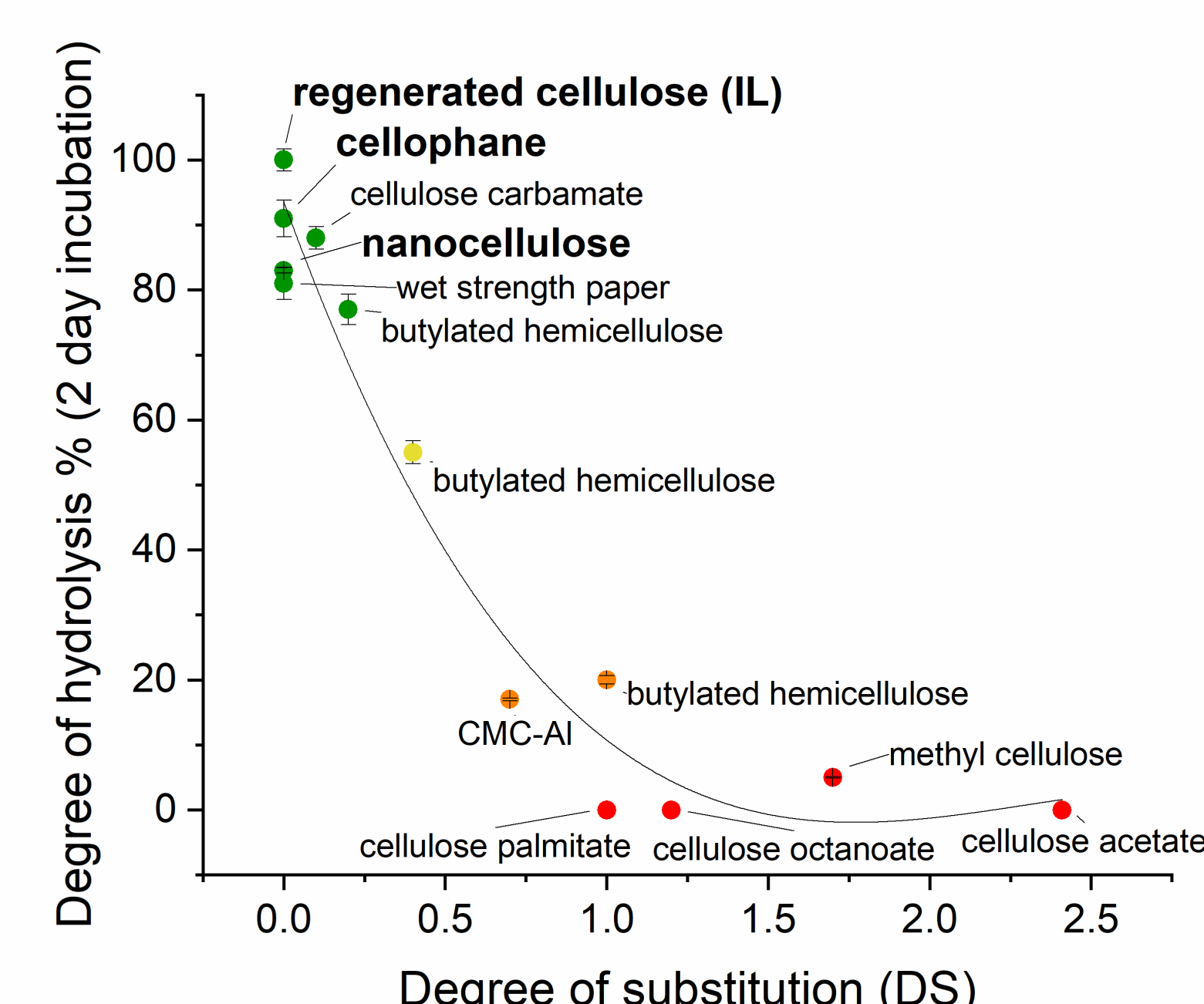
Mechanical properties of selected cellulose-based films. Cellophane was a commercial grade. Nanocellulose film and regenerated, plasticized cellulose film (BioCelsol) were produced in lab scale.



Oxygen transmission rate of different cellulose films measured at 50%RH, 23 °C



Effect of plasticizer bath consistency on regenerated cellulose film (BioCelsol) tensile strength and strain at break with restricted drying.



Biodegradation of cellulose-based films by enzymatic hydrolysis in a 2-day incubation. The degree of hydrolysis (%) is presented as the function of the degree of substitution (DS).

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