Experimental micromechanical characterisation of wood cell walls

Abstract

The properties of wood and wood-based materials are strongly dependent on the properties of the fibres, that is, the cell wall properties. It is thus highly important to be able to mechanically characterise cell walls in order to understand structure–property relationships. This article gives a brief overview of the state of the art in experimental techniques to characterise the mechanical properties of wood at both the level of the single cell and that of the cell wall. Challenges, opportunities, drawbacks and limitations of single fibre tensile tests and nanoindentation are discussed with respect to the wood material properties.

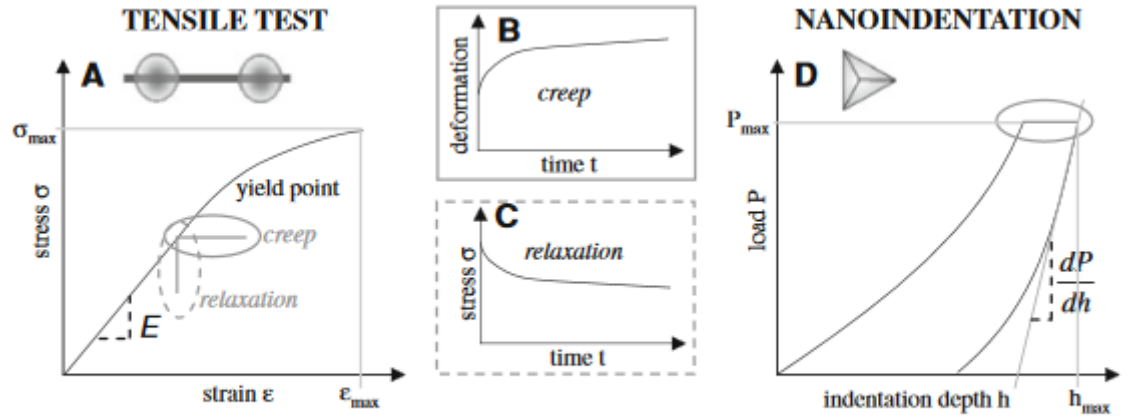

Fig. 1 Schematic stress–strain and loading–unloading *curves* obtained during tensile tests (**a**) and nanoindentation experiments (**d**). **b**, **c** Characteristic *creep* and *relaxation curves*