Abstract No 42

# In-situ reinforcement of polymer matrices by self-assembling of tectons

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Dibenzylidene sorbitol (DBS) and other low molecular weight compounds (tectons = building blocks) are known to form thermo-reversible physical network structures in organic solvents due to hydrogen bonds between the tecton molecules. We have investigated the tecton self-assembling into long fibers with an aspect ratio of hundred and higher in polymer matrices such as polystyrene (PS), polypropylene (PP) and others. As in organic solvents, the addition of tectons to polymers leads under certain circumstances (mainly a decrease in temperature) to a liquid-solid transition of the melts. We study under which conditions fibers and similar structures are formed in the different matrices and what are the rheomechanical properties of these compounds. It is found that the enthalpic interactions as given by the solubility parameters of the polymers and tectons are of crucial importance for the temperature range in which self-assembling sets in. Formulas will be presented which allow an estimate of the characteristic temperatures. While fiber formation is observed in many matrices, a strong reinforcing effect is only observed for the DBS/PS system. We analyze the reasons leading to such a result.