**Thermoanalytical methods and their applications to characterize carbon nanotube - rubber nanocomposites**

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Abstract:

Thermoanalytical methods are well established techniques to examine temperature dependent material properties such as glass transition, melting and crystallization, degradation, thermal conductivity, thermal expansion, viscoelastic properties and others. Due to the enormous surface to volume ratio of nanoparticle, the polymer-filler interactions become an important parameter determining the final properties of the material. Nanoparticle are able to immobilize a certain fraction of the polymer at and near the surface. Glass transition measurements can be used to provide information on interfacial effects in nanocomposites. The concept of a rigid amorphous fraction (RAF), initially introduced for semicrystalline polymers, will be applied for characterization of carbon nanotube – rubber nanocomposites. The nanocomposites will be mainly investigated by calorimetric measurements using differential scanning calorimetry (DSC), temperature modulated DSC (TMDSC) and fast scanning chip calorimetry (FDSC).