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in kemijsko tehnologijo

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**VABILO NA PREDAVANJE
V OKVIRU DOKTORSKEGA ŠTUDIJA
KEMIJSKE ZNANOSTI**

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z naslovom:

**Expanding Quantitative Material Thermal
Analysis Viewing and Recording Images of
their Transformation**

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v predavalnici 1 v 1. nadstropju Fakultete
za kemijo in kemijsko tehnologijo, Večna pot 113

Vljudno vabljeni!

Povzetek:

One of the oldest thermal analysis instruments with real time viewing device is the heating microscope, which was used formerly by us for dimensional analysis of sintering of ceramic materials^{1,2}. In this presentation we will discuss analyses of **Amorphous PET, HDPE and LDPE Blend, Thermo-Invisible Ink** and **PS Annealing Process**, by **DSC-RV** (Differential Scanning Calorimetry with Real View); **Analyses of PMMA, PVA Fiber and NBR Rubber samples by TG/DTA-RV** (simultaneous Thermogravimetric and Differential Thermal analysis with RV) and analysis of **Amorphous and Crystalline PET films by DMA-RV** (Dynamic Mechanical Analysis with RV). These instruments have image capturing devices, which enable following morphological and dimensional changes through images or videos recorded in real time. Visual observation helps to state with certainty what exactly is happening, mainly in transformations without mass change or when the mass cannot be measured as in DSC, DTA, TMA or DMA analyses without any need to hypothesize what may be occurring.

An example is shown in Figure 1, which shows simultaneous TG/DTA analysis of PVA fiber and what can be seen at different temperatures. During heating process, subsequently, some humidity is lost up to 150 °C, an alpha crystalline transition occurs at 235 °C, which is right after superseded by PVA melting and finally, thermal decomposition of the liquefied mass begins at 300 °C. In the video bubble formation during decomposition can be observed in real time. Other important examples can be seen in a previous paper published about antioxidants effect on biodiesel analysis³.

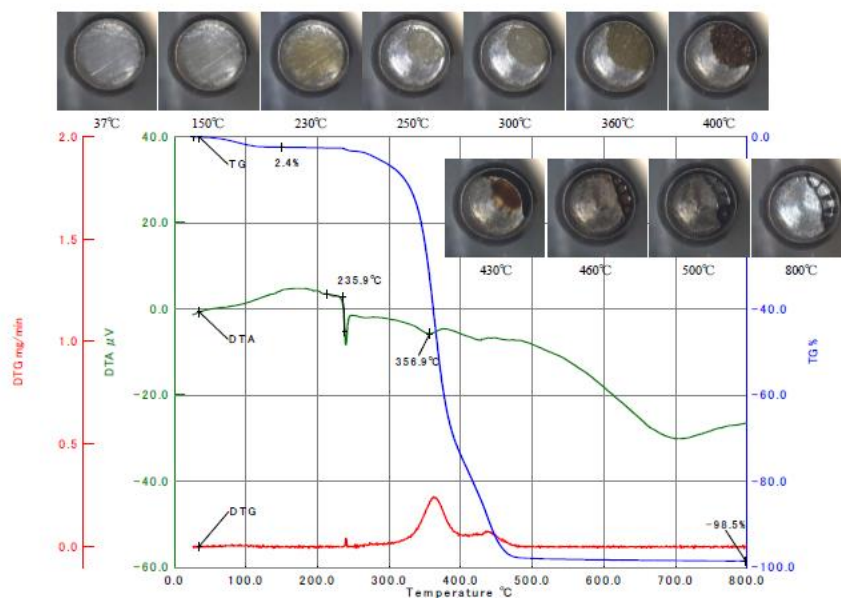


Figure 1: TG, DTG and DTA curves of PVA fibers with some captured images during analysis.

References:

1. Dweck, J, Morais, LC, Fonseca, MVA, Campos, V, Büchler, PM , *Calcined Sludge Sintering Evaluation by Heating Microscopy Thermal Analysis*, J Therm Anal Calorim, 95 (2009) 985–989.
2. Brites Fontoura Rangel, BF, Viana, MM, Fonseca, MVA, Dweck, J, Tavares LM, *Thermal characterization of a new green ceramic material by heating microscopy, thermogravimetry and differential thermal analysis*, J Therm Anal Calorim, 121 (2015) 115–125.
3. Leonardo, RS, Murta Valle, ML, Dweck, J, *The thermal processing in air of ethylic soybean biodiesel after accelerated aging, with and without antioxidant*, J Therm Anal Calorim, 131 (2018) 343–352.