

STSM - VALIDATION OF ACTIVITY OF PREPARED BIOPOLYMER-BASED NANOFIBERS CONTAINING PLANT ESSENTIAL OILS



Aleksandra Miletić^a, Begonya Marcos^b, Branimir Pavlič^a, Ivan Ristić^a, Branka Pilić^a

^a University of Novi Sad, Faculty of Technology, Novi Sad, Serbia

^b Tecnologia Alimentària, IRTA -Food packaging, Girona, Spain

E-mail: alexm@uns.ac.rs

INTRODUCTION: Oxidation, together with humidity and temperature, is one of the main reasons for food spoilage and many efforts are put in to prevent this and to increase shelf life of easily-oxidized food. One of the ways to prevent oxidation is to use active packaging materials loaded with antioxidants, instead of adding them directly to the product. Meat and meat products are of special interest, because they are susceptible to oxidation and have very short shelf life.

DESIGN OF THE EXPERIMENT

Preparation of PLA-based nanofibers using electrospinning technique loaded with different essential oils as antioxidants.

Essential oils: fennel, thyme, juniper and black cumin.

Characterization of nanofibers: SEM, DSC, antioxidant activity and FTIR

Application of antioxidant fibers as active pad for packaging of dry-cured sausage using vacuum packaging technique.

Shelf-life study of cured meat product and examination of product quality (color and TBARS) at 5 sampling times: t₀, t₇, t₁₄, t₂₁ and t₂₈.

Examination of active materials properties after use.

Characterization: SEM, DSC, antioxidant activity and FTIR. - ongoing

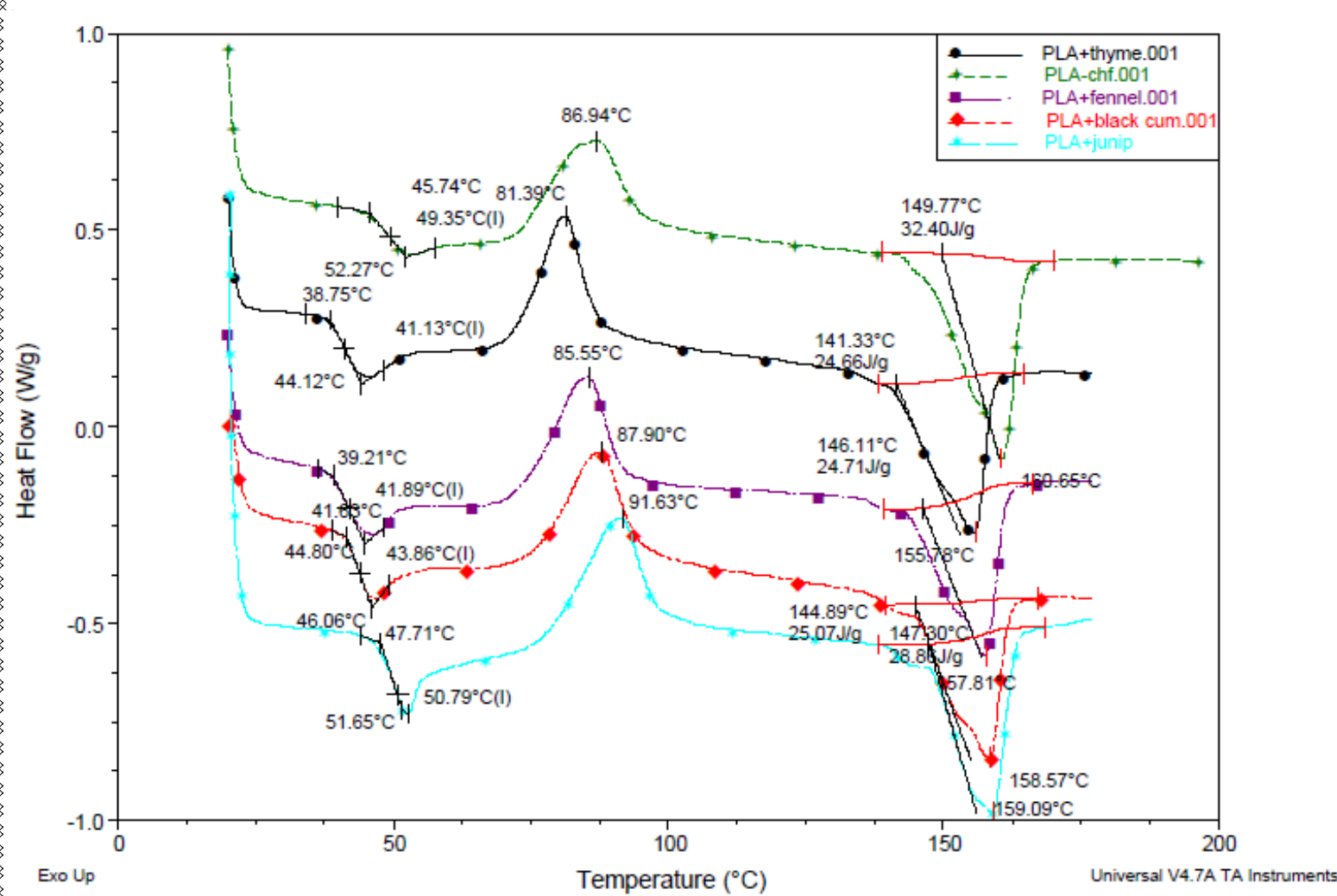


Figure 1. DSC curves of PLA-based fibers

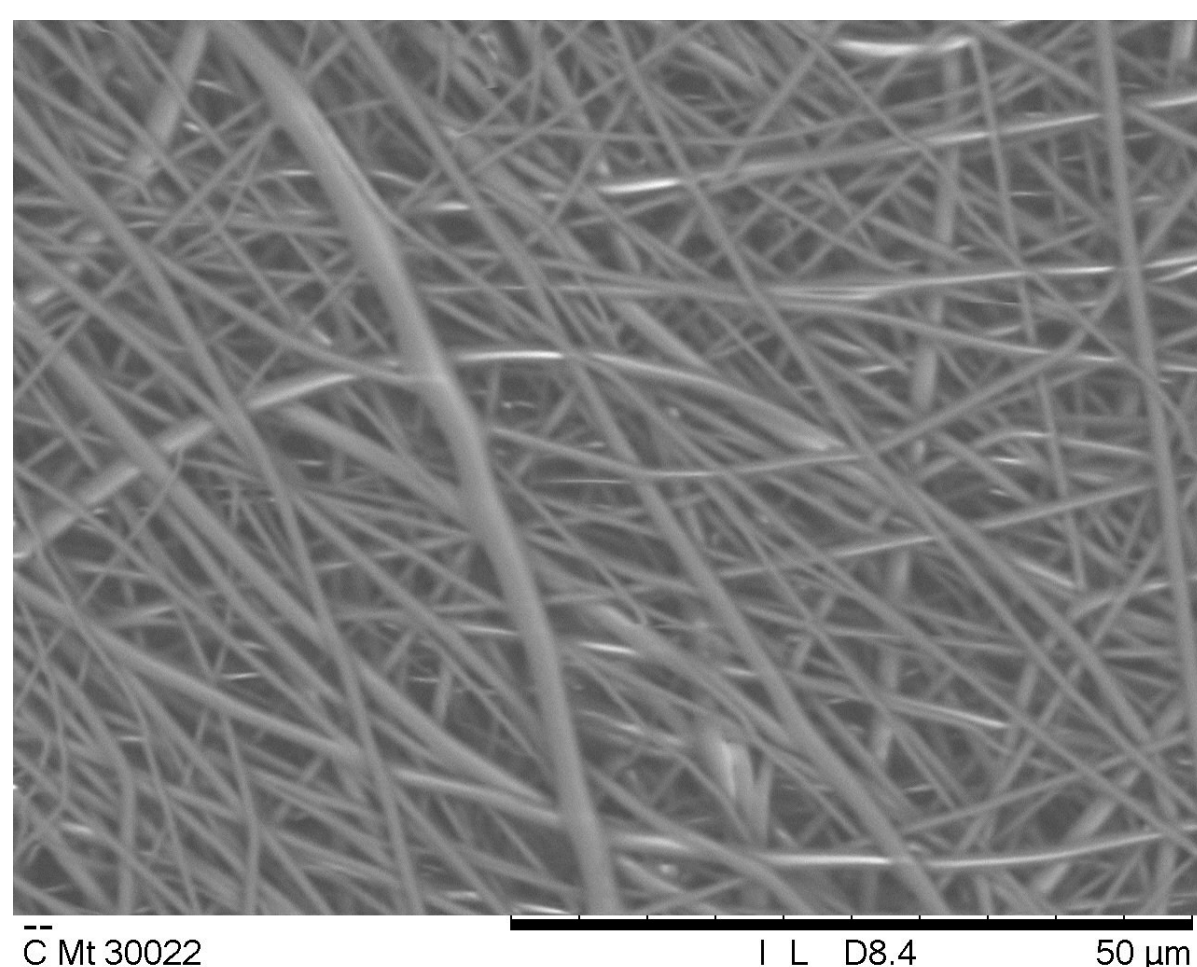
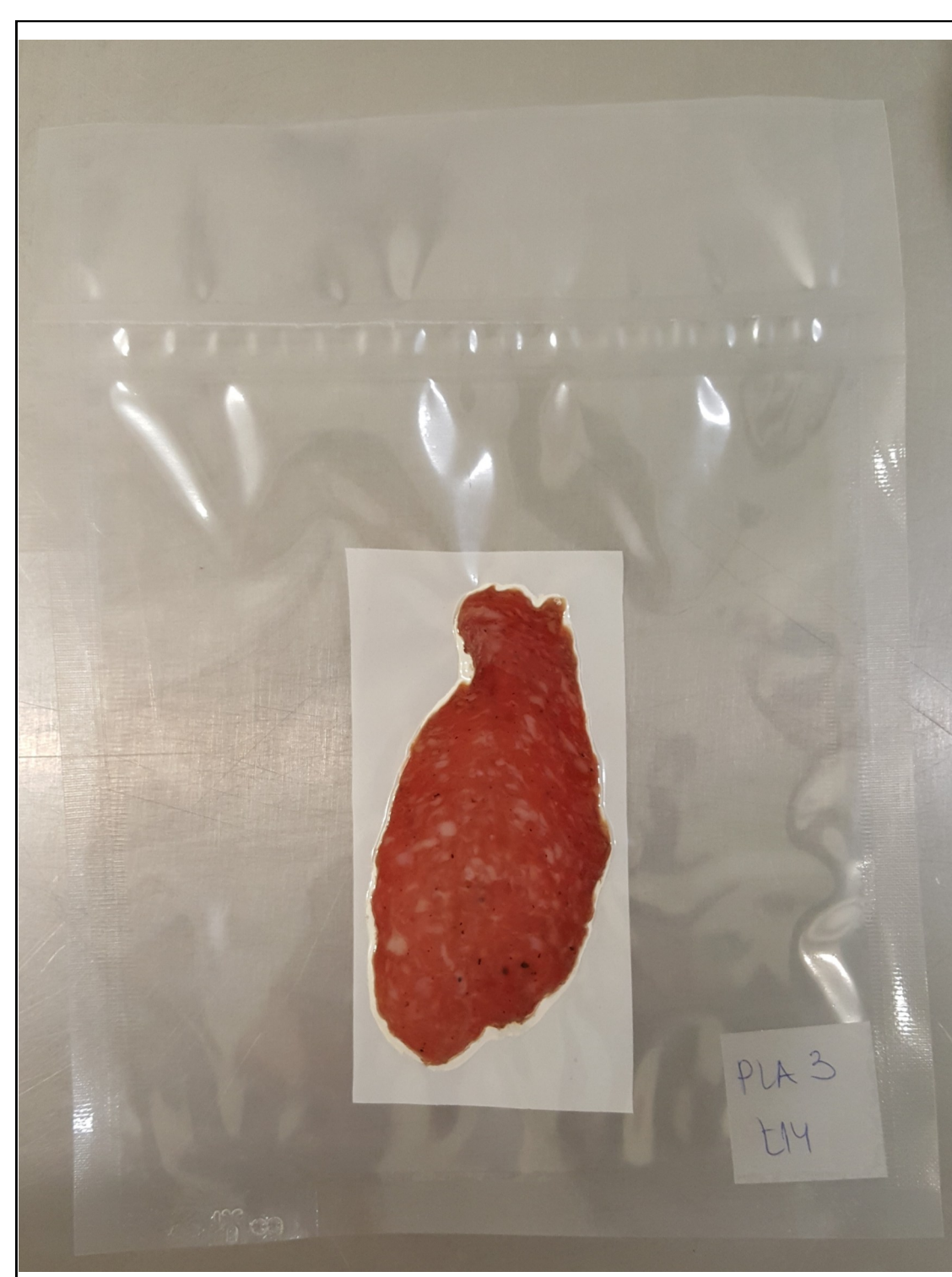


Figure 2. PLA-based fibers loaded with thyme essential oil



Demonstrator: dry-cured sausage packed into polymer bags with PLA-based fibers as pad

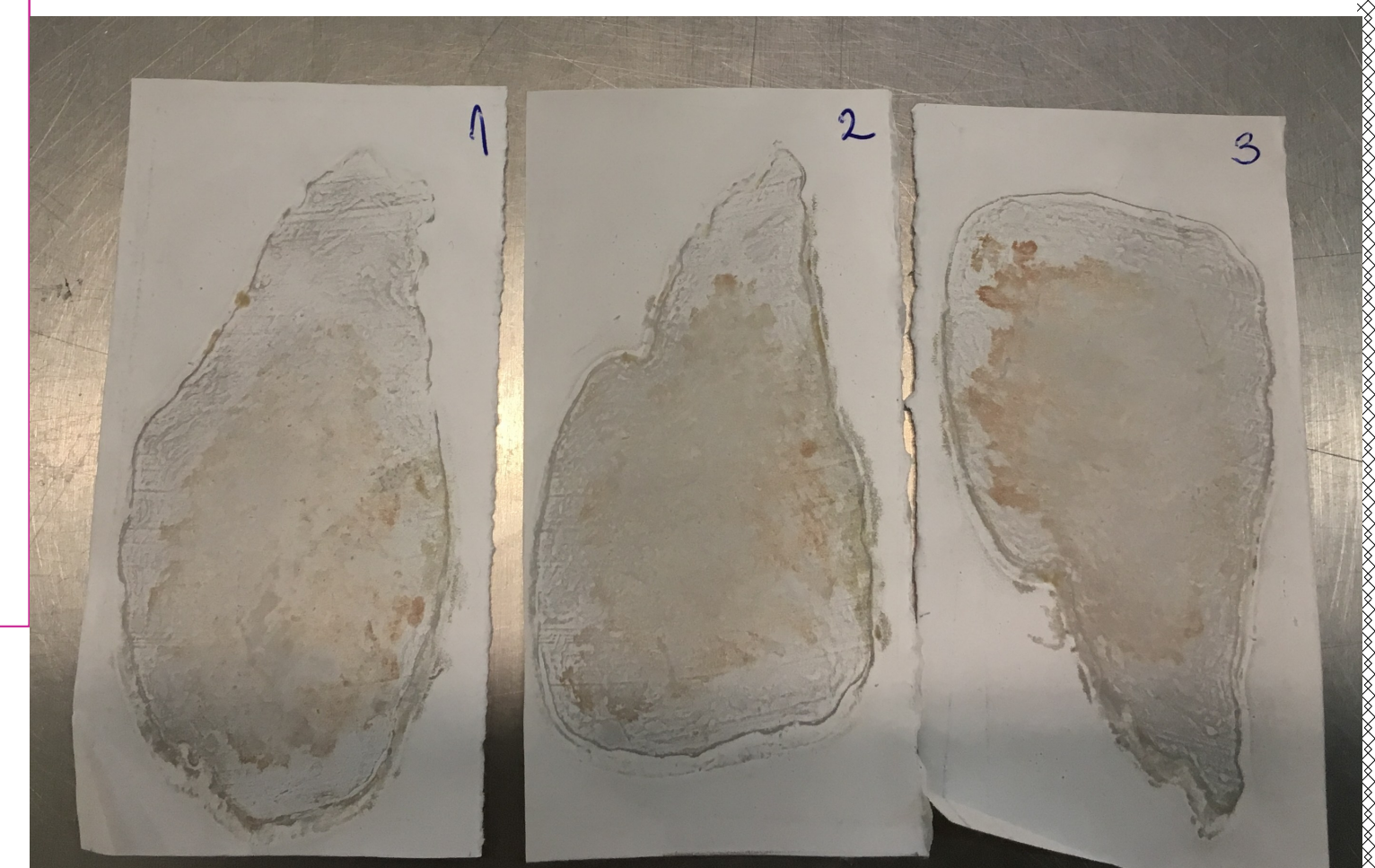


Figure 3. Fennel-loaded PLA-based film after 21 days

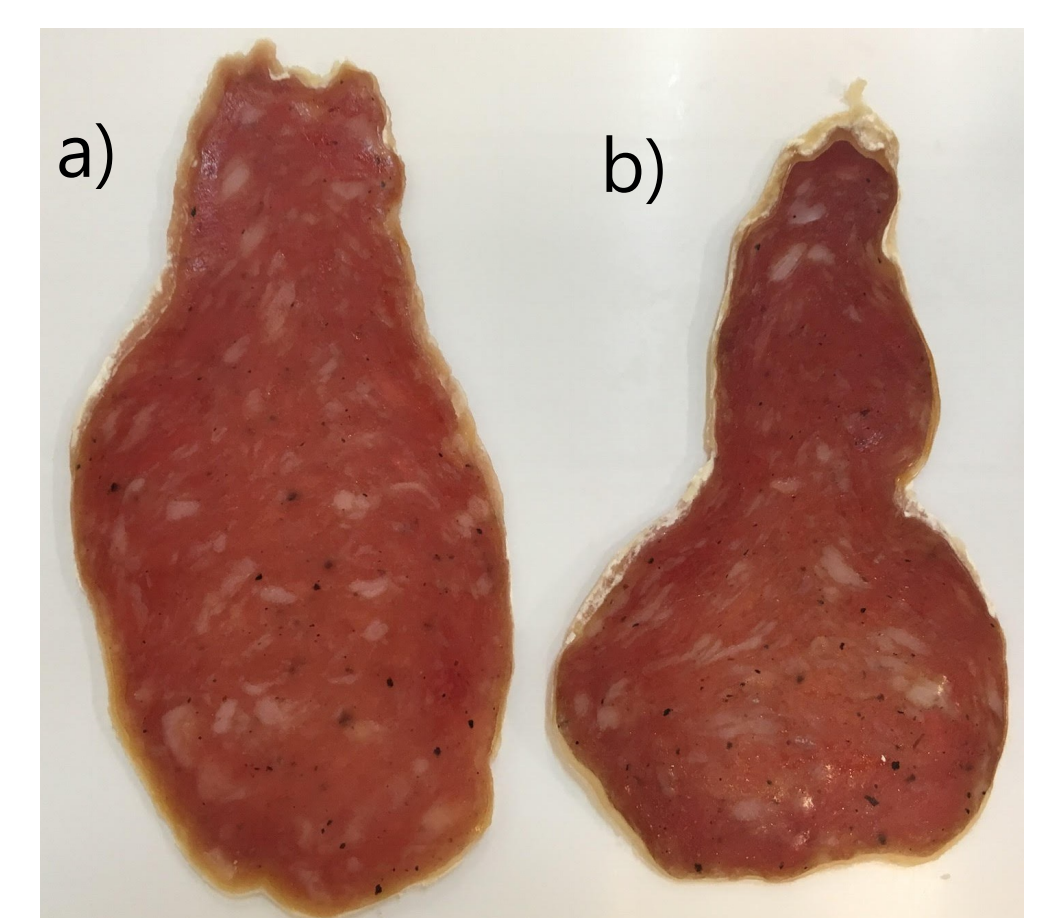


Figure 4. Dry-cured sausage after 28 days
a) color control and b) sausage packed with black cumin active pad

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