

COST Action no. FA0904

Eco-sustainable Food Packaging Based on Polymer Nanomaterials

2010 | 2014

Objectives

- To constitute an international scientific and technology network on issues related to eco-sustainable Polymer Nanocomposites for Food Packaging (PNFP) for the preservation, conservation and distribution of high quality and safe food;
- To contribute to exploit the potentiality of polymer nanotechnology in the area of food packaging treating in a complete way the demanding needs of the users, such as health, environment, taste, cost and the specific requirements of the food industry;
- To look at the complete life cycle of the PNFP by the combined efforts of leading research and industrial groups;
- To contribute to identify the barriers (in research and technology, safety, standardisation, trained workforce and technology transfer) that prevent a complete successful development of PNFP and the strategies to proceed further.

Main Achievements

The intensive cooperation among the Action Institutions straightened through the numerous STSMs and the exchange of ideas/expertises at the Action workshops has permitted innovative advance in knowledge and to obtain innovative results and breakthroughs. The most promising results are focused on:

- the optimization of deposition process condition of carbon films on polymer foils to increase barrier properties;
- the design and construction of an innovative apparatus that allows to perform measurements of gas permeability through polymer foils;
- the implement of innovative techniques and methodologies like modelling and nanoindentation to characterize surface morphology and to predict micro- and macroscopic properties of polymeric materials on the base of the degree of clay exfoliation and of clay loading;
- the development of innovative microcomposites based on isotactic polypropylene for food packaging and zinc oxide with the assessment of the extend of particles migration into food simulants.

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Food and Agriculture FA

Participating countries

COST Countries: AT, BE, BG, CH, CY, CZ, DE, DK, ES, FI, FR, GR, IE, IL, IS, IT, LT, LV, MK, NL, NO, PL, PT, RO, RS, SI, SE, UK.

Non COST Countries: USA, CA, BR, NZ, DZ

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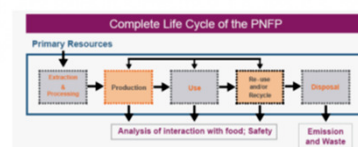
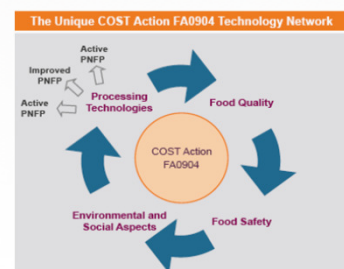
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Website

www.costfa0904.eu



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ESF provides the COST Office through a European Commission contract



Working Group activities

WG1 Development of new safe PNFP

- Organization of a two days workshop at Espoo in September 2011;
- Initial steps for the organization of a workshop in Prague March 2013 on surface modification.

WG2 Development of new processing technologies including modelling and simulation / WG3 Development of new strategies to identify any critical interaction with food

- Organization of the workshop of the two WGs in Valencia, March 2012. Many relevant issues were discussed and new people, including numerous industrial representatives coming from several countries, joined the meeting to present their views and point out their view on the importance of exploiting nanotechnology for food packaging applications;
- Initial steps for the organization of a workshop in Prague on surface modification March 2013.
- Initial steps of a Workshop of WG2/WG3 in Wroclaw (Poland), Sept 2012.

WG4 Ethics, Standardization, Science- society dialogue

- The activity of the group was largely concerned with the communication aspects of the new technology in relation to benefits, risk policy (inc. life cycle framework and precaution), research ethics, technology governance, standardization (inc. labeling), through two kinds of communications: Inner communication and Outer communication; Involvement with the European projects on nanosafety, like Nanosafe clusters;
- Initial steps of a Workshop on November 2012 in a location to be chosen: (Rome or London). This workshop will have the characteristics of a training seminar on WG4 topics both senior and young researchers.

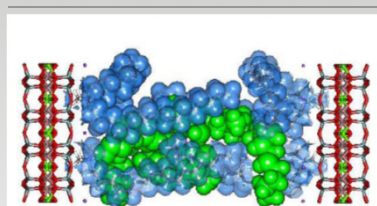
The WG workshops covered all aspects for manufacturing successfully polymer nanomaterials for food packaging application.

The presentations are available for free downloading at www.cost0904.eu.

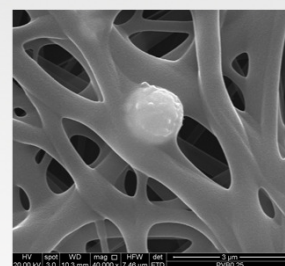
Plan for the future involving all the WGs is the International Conference to be organized in March/April 2013 in Zurich (CH).

The progress of the WGs also includes:

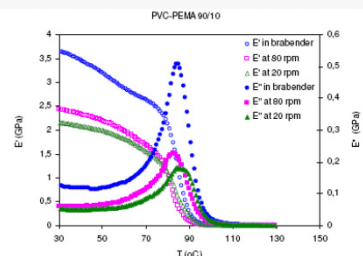
- Organization of 1st Training School held in Skopje November 2011, focused on all the topics of the WGs;
- Activities performed by the intergroup "Making the Science of future in PNFP" (2nd Round table in Valencia; Award assignment for the best ESR poster, etc.). Plan for future is the organization of a workshop fully dedicated to ESRs' research.



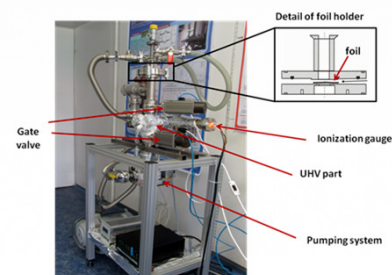
3-component model for energy calculation and spacing determination



SEM micrograph of PVB/ZnO electrospinning fibers



Storage and loss modulus for PVC/PEMA blends under different flow conditions



Chamber for measurements of film permeability



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