

WELCOME

The Organizing Committee kindly welcomes you at the International Conference “Functional materials and nanotechnologies” **FM&NT-2012**. The conference is organised by Institute of Solid State Physics, University of Latvia in co-operation with National Research programme in Materials Science and Information Technologies of Latvia.



The purpose of the conference is to bring together scientists, researchers, engineers and students from universities, research institutes and related industrial companies working in the field of advanced material science, energy and materials technologies.

Scientific topics of the conference

Multifunctional Materials:

Advanced inorganic, organic and hybrid materials; ferroics; multiscale and multiphenomenal material modelling and simulation;

Nanotechnologies:

Progressive methods, technologies and design for investigation of nanoparticles, nanostructures, nanocomposites, thin films and coatings;

Energy:

Perspective materials and technologies for renewable and hydrogen energy, fuel cells, photovoltaics and developing diverse energy systems.

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The Organizing Committee sincerely hopes that the conference will give all the participants new insights into the wide spread development of functional materials and nanotechnologies and will enhance the circulation of information released at the meeting.

On behalf of FM&NT-2012 organizers thank you all for coming and we wish you most successful and enjoyable conference.

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Commercial and Prosthetic PMMA Surface Wettability Regulation

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The subject of current research is modification of surface properties in nano scale with aim to improve poly methyl metha acrylate performance for biomedical applications where interaction between material and surrounding environment is critical, e.g. contact lenses, dental applications, bone cement and many others. Charge on materials surface is strongly related to surface energy which in turn influences surface adhesion property and wettability property. Prosthetic PMMA surface properties including related biocompatibility are affected during time due to mechanical impact – wear between eye lense and eye lid; surrounding factors – wind, sand, sun. Mentioned factors lead to discomfort, inflammations for patients in case of eye lenses; to poor attachment capability in case of dental applications therefore many are trying to improve PMMA material.

It has been found previously that Ultra Violet radiation might be in use to regulate wettability properties of prosthetic PMMA [1]. Namely UV radiation affects surface level influencing surface charge which is strongly related to surface hydrophobicity/ hydrophilicity, werewith – to adhesion and biocompatibility property.

The mentioned irradiation method is new (200-400nm wavelength has been very poorly studied) and relatively to existing methods – a simple method at room conditions, with energy enough to modify properties only at surface level. Therefore in frames of current study commercial PMMA (“Nudec”) was brought under the same UV radiation influence to verify efficiency of the method. Contact angle measurements (sessile drop method) demonstrated very close effect that on prosthetic PMMA occurred (fig.1) – material properties alterate from more hydrophobic to more hydrophilic.

Results show that it might be possible to regulate surface properties also of commercial PMMA that would open new possibilities in both medical and non-medical fields.

References

1. Y. Dekhtyar, L. Lancere. *Surface wettability regulation for prosthetic applications*. 15th International Conference of Biomedical Engineering, 215-218 (2011), ISSN 2029-3380.

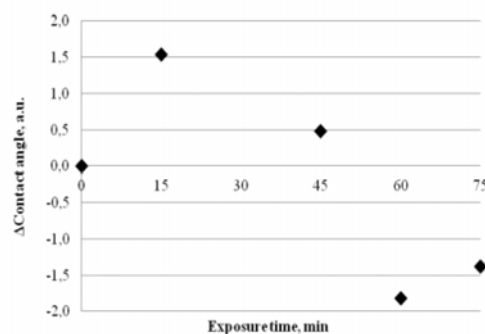


Fig.1 Contact angle increment depending UV radiation exposure time.