AEROGELS
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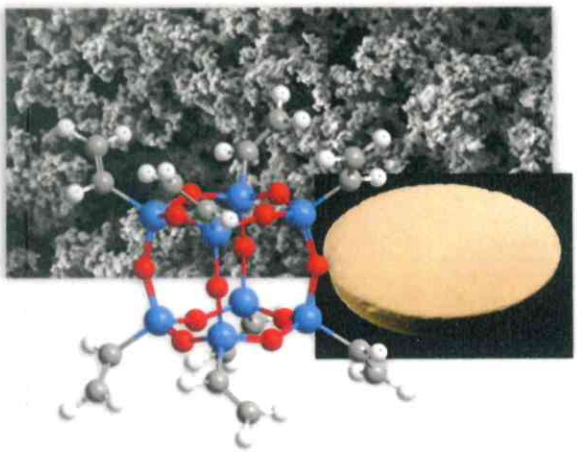
BOOK OF ABSTRACTS

Aerogels processing, modelling and environmental-driven applications



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Cellular studies of piezoelectric nanofibers with ultrasound stimulations

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Electrospun piezoelectric fibers can be used in tissue engineering (TE) as a smart analogue of the natural extracellular matrix (ECM). Our results show the effect of rotational speed of collecting drum on polyvinylidene fluoride nonwovens morphology, phase content and resulting biological properties in vitro conditions. The morphology and phase composition were analysed using scanning electron microscopy (SEM) and Fourier Transform Infrared Spectroscopy (FTIR), respectively. It was shown that increasing rotational speed of collector leads to increase of fiber orientation, reduction of fiber diameter and considerable increase of polar phase content, beta and gamma. In vitro cell culture experiments carried out with the use of ultrasounds in order to generate electrical potential via piezoelectricity, indicate positive effect of polar phase containing PVDF on the fibroblasts. Our preliminary results demonstrate that piezoelectric PVDF scaffolds are promising materials for tissue engineering applications, particularly for neural tissue regeneration, where the electric potential is crucial.

References

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