Preparation and modification of nanolayered polymer materials for preservation and restoration

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**Abstract**

The main aim of this work is to get and modify nanofiber materials for utilization in the process of preservation of cultural heritage objects. The topic deals with nanofiber materials made from polymeric substances (polyamide, polyethylene, polyethersulfone, polystyrene), their UV stabilization using light stabilizers and plasmochemical modification by organosilicon compounds (siloxane) for gaining greater ultrahydrophobicity. Other characteristics of nanofiber materials (accelerated ageing, IR spectra, high-performance liquid chromatography) were determined using physico-chemical methods.

**Reference:**

[1] Z. M. Huang, Y. Z. Zhang, M. Kotaki, and S. Ramakrishna, “A review on polymer nanofibers by electrospinning and their applications in nanocomposites,” *Compos. Sci. Technol.*, vol. 63, no. 15, pp. 2223–2253, Nov. 2003.

[2] V. Švachová, L. Vojtová, D. Pavliňák, L. Vojtek, V. Sedláková, P. Hyršl, M. Alberti, J. Jaroš, A. Hampl, and J. Jančář, “Novel electrospun gelatin/oxycellulose nanofibers as a suitable platform for lung disease modeling,” *Mater. Sci. Eng. C*, vol. 67, pp. 493–501, Oct. 2016.

[3] D. Pavliňák, J. Hnilica, A. Quade, J. Schäfer, M. Alberti, and V. Kudrle, “Functionalisation and pore size control of electrospun PA6 nanofibres using a microwave jet plasma,” *Polym. Degrad. Stab.*, vol. 108, pp. 48–55, Oct. 2014.

[4] A. Manakhov, D. Nečas, J. Čechal, D. Pavliňák, M. Eliáš, and L. Zajíčková, “Deposition of stable amine coating onto polycaprolactone nanofibers by low pressure cyclopropylamine plasma polymerization,” in *Thin Solid Films*, 2015, vol. 581, pp. 7–13.