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Nanostructured porous silicon-based materials for novel plasma energy systems ALEKSANDR MUSTAFAEV, ROSTISLAV SMERDOV, Saint-Petersburg Mining University, YULIA SPIVAK, Saint Petersburg Electrotechnical University "LETI" — The perspective application of functionalised nanostructured fullerene and porous silicon-based composite materials for promising alternative energy conversion systems is considered in this study. Fullerene and porous silicon (PS) are suggested for further implementation of PETE (photon-enhanced thermionic emission for solar concentrators) and thermionic energy converter (TEC) electrodes due to the remarkable properties displayed by these structures.[1] The investigation of PS-based materials functionalised with fractal-like silver clusters for PETE and TEC electrodes synthesis is reported. We utilised UV-Vis spectroscopy to characterise the surface structure of PS/Ag layers. Localised surface plasmon resonance (LSPR) phenomenon occurring within the array of Ag nanoparticles is observed. Two characteristic absorption bands located in the visible spectrum are detected; their nature is attributed to the LSPR effect taking place in the two distinct nanoparticle arrays forming during the synthesis process. It is possible to control the intensity of these bands with synthesis parameters of PS matrix.[2]

[1]R.S. Smerdov, Yu.M. Spivak, et al., **J. Phys.: Conf. Ser.** 1038 012064
[2]R.S. Smerdov, A.S. Mustafaev, et al., **J. Phys.: Conf. Ser.** 1135 01203

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