



Technology for Solid Oxide Fuel Microelements

[application areas] Energy. [year of invention] 2014. [authors] Prof. habil. dr. Brigita Abakevičienė, Prof. habil. dr. Sigita Tamulevičius, Dr. Viktoras Grigaliūnas, PhD student Jolita Sakaliūnienė.	features, technical specifications Fuel elements are devices which convert chemical energy directly into electric power without combustion and without leaving almost any sulphur and nitrogen oxide and hydrocarbon emissions, with the final product being electric power and water. Solid oxide fuel elements are widely researched thanks to their potential application in energy. These microelements have 3-4 times higher energy density and specific energy as compared to the traditional nickel metal hydride and lithium-ion batteries. At the moment, there is an increasing number of studies	performed in order to reduce the small (micrometric) solid oxide fuel elements. Their several watts in power and can be used in various portable devices: portable computers, video cameras, cameras, portable scanners, chargers, and various medical equipment. As of 2012, the scientists of Kaunas University of Technology, Vilnius University, and the Centre for Physical Sciences and Technology designed a manufacturing process for multilayer membrane structures of solid oxide fuel microelements (μ-KOKE) and a prototype of a solid oxide fuel microelement.	[novelty] In order to use solid oxide fuel microelements in the consumer market as energy sources in portable devices, we need to decrease their dimensions down to the micrometric level (the thickness of the membrane structure (anode-electrolyte-cathode) is 1 μm). An effective technology for forming solid oxide fuel microelements has been designed, including microfabrication and microtechnology methods.	[technological readiness level] A prototype (undergoing research). [what are we looking for in this stage of development?] Funding for further research and completion of the prototype; R&D orders related to the invention; partners from scientific institutions for joint research.	[patenting] Patentability analysis required. [commercialisation] Yet to try. [alternatives] Similar products are formed and analysed during laboratory studies.
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