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## Meta-dielectric for energy storage

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Energy storage units having both high energy density and high power density are important for further progress of technology. As the limitations of energy density and power density of the batteries are difficult to overcome, the right alternative solution might arrive from the capacitor technology with improved permittivity and breakdown voltage of insulating materials. In the present paper, we propose to use the engineered polymers to develop capacitors having high energy density. We believe that the proposed approach provides a new generation of the energy storage devices promising the solutions to the many needs of the society.

Polymers can be engineered to achieve significant polarizability in the frequency range of kHz-MHz, which makes such systems most suitable for the energy storage purposes. The conduction can compromise the high dielectric strength of the dielectric. To avoid this, we propose to couple the polymer cores to high resistivity materials.

In this work, we report our analysis of the feasibility to extract favorable dielectric properties based on composites of polymers.

### Biography:

Pavel Lazarev is the inventor of Capacitor Sciences' high permittivity technology and founder of the Company. He also is the founder of Cryscade and inventor of the company's Donor-Bridge-Acceptor technology. He received his Masters from Moscow State University, Ph.D. in Crystallography and Dr. of Science Degree in Biophysics from the Russian Academy of Science. Previously, Pavel founded Nanotechnology MDT ([www.nt-mdt.com](http://www.nt-mdt.com)), Akvion ([www.akvion.ru](http://www.akvion.ru)), Optiva Inc., Ribtan Inc. ([www.ribtan.com](http://www.ribtan.com)) and Crysoptix KK, ([www.crysoptix.com](http://www.crysoptix.com)). Pavel was an editor of International Journals 'Molecular Engineering', 'Nanobiology' and 'Molecular Materials'. Pavel has published several books, over 150 technical publications and over 200 inventions with emphasis on the R&D and production of functional crystalline films based upon coatable lyotropic liquid crystals.