

The future of energetics is at hand



It is hard to imagine our everyday life without electricity: it is essential for all human activities – industries, agriculture, science and medicine, let alone its household use. Despite the assistance of a man's best friends - the sun, air, and water (rivers, to be exact), the power they provide cannot keep up with the demand of the growing population. That is why energy engineers, physics and chemists around the world, and [the ones from SPbPU](#), search for alternative sources of power and methods of its conservation.

However, new methods alone could hardly save the day for us if they are not supported by past experience. Concerns about safety issues with some gadgets, which have become vital for our existence, have risen after multiple cases of smartphone explosions. According to the chief researcher of SPbPU Mr. M. Maksimov, explosions might have been caused by failure of electronic components, battery decomposition or the materials used by manufacturers. 'As a result, thermal overload leads to gas emission in batteries, which is present in a confined space, and is often followed by explosion', - explained the expert.

To avoid such incidents scientists will have to do profound research on the available methods of energy conservation and upgrade them. In 2016 the Russian-Chinese Research Center for New Energy Technology and Materials was opened in Changxing by Polytech and their Chinese colleagues. The center is involved in creation of a silicate-based composite cathode material for traction batteries meant to decrease the cost of Li-ion batteries. Moreover, an agreement for

scientific and technological cooperation in the field of nanomaterials and LI-ion batteries was signed with the authorities of Changxing.

Another energy innovation, the organic electronics, was introduced to SPbPU students by the vice-president of RAS, the chairman of the Urals branch of RAS Mr. V. Charushin who delivered a lecture on “Modern Organic Synthesis”. The creation of light, thin, flexible and translucent solar batteries used for the charge of electronic devices is the work of chemists. ‘It was organic electronics that stood behind the creation of super light and super thin devices and their compatibility with inkjet and printing technologies. There is definitely a bright future awaiting organic electronics,’ – concluded Mr. Charushin.

Since energy supplies are running out fast, the scientists consider it a priority to find ways of its efficient consumption, including preservation of every joule of energy when it is being transported. Polytech scientists designed a 30-kilowatt turbine generator set working with compressed gases. This turbine transforms pressure ratio produced in the course of gas transportation into free electricity.

The researchers from the Institute of Physics, Nanotechnology and telecommunications of SPbPU in cooperation with French, Swiss and Polish colleagues took the first step towards the creation of electrolyte-free accumulators.