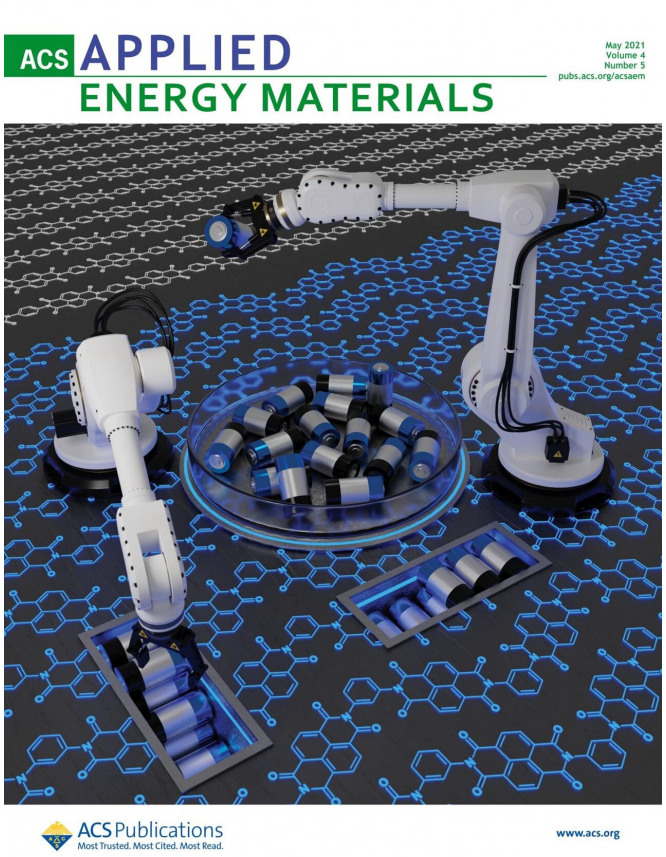
Researchers propose an attractive cheap organic material for batteries

25 May 2021



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A new report by Skoltech scientists and their colleagues describes an organic material for the new generation of energy storage devices, which structure follows an elegant molecular design principle. It has recently been published in *ACS Applied Energy Materials* and made the cover of the journal.

While the modern world relies on energy storage devices more and more heavily, it is becoming increasingly important to implement sustainable battery technologies that are friendlier to the environment, are easy to dispose, rely on abundant elements only, and are cheap. Organic batteries are desirable candidates for such purposes. However, organic cathode materials that store a lot of energy per mass unit can be charged quickly, are durable and can be easily produced on a large scale at the same time, remain underdeveloped.

To address this problem, researchers from Skoltech proposed a simple redox-active polyimide. It was synthesized by heating a mixture of an aromatic dianhydride and meta-phenylenediamine, both easily accessible reagents. The material showed promising features in various types of energy storage devices, such as lithium-, sodium- and potassium-based batteries. It had high specific capacities (up to ~140 mAh/g), relatively high redox potentials, as well as decent cycling stability (up to 1000 cycles), and abilities to charge quickly (