Scientists Test A Potentially More Stable EV Battery Solution

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In 2023, electric vehicle batteries live with certain constraints, due to a variety of reasons. Reliable energy densities that achieve the ranges customers expect require batteries of certain sizes—and of course, certain weights. Battery degradation over charge cycles is also a major concern, both from an engineering standpoint, and also from a vehicle owner standpoint—because buying replacement batteries isn't cheap.

These are just a couple of the reasons why researchers are currently working to improve battery technology for EVs. In a December, 2022 paper published in the peer-reviewed scientific journal Nature Materials, a team of researchers from Japan and Australia discussed their experimentation into enhancing lithium battery stability, in a solid-state battery form.

In testing, the team examined the comparative stability of lithium vanadium oxides in solid-state batteries over multiple charge cycles. Impressively, after 400 cycles were complete, they observed no capacity fading and degradation. The team summarized what they believe their research shows with the title of the paper, A Near Dimensionally Invariable High-Capacity Positive Electrode Material.

These researchers certainly aren't alone in trying to find ways to improve EV battery technology as we currently know it. In December, 2019, researchers at Rice University talked about the work they were doing to explore the possibilities of thin carbon nanotube films and lithium metal batteries. The use of carbon nanotubes, the scientists said at the time, could improve energy density immensely, as well as prevent the rise of dendrites that currently cause problems in standard lithium battery charge and discharge cycles, which can eventually short-circuit those batteries.

In May, 2021, a team of Harvard researchers proposed a different lithium-metal solution that wouldn't require total inhibition of dendritic growth. Instead, the researchers said, if they

could find a way to both control and contain where the dendrites grew, they could (at least in theory) prevent them from becoming a problem. Their researcher was also published in a related peer-reviewed scientific journal at the time, Nature.

In September, 2022, researchers at the Massachusetts Institute of Technology (MIT) proposed to solve the current lithium-ion battery quandary with a completely different battery architecture. Using aluminum and sulfur as electrodes, this proposed solution would rely on a molten salt electrolyte. This combination of ingredients has multiple selling points. They're inexpensive, they're abundant, and crucially, they're not flammable. (Seriously, how many stories about electric vehicle batteries of any kind have you read where they've caught fire? Even if you don't really pay attention to EV news, we'd imagine you've seen at least a few in recent time.)

Read the original article on RideApart.