Transparent lithium-ion battery that recharges via the sun demonstrated

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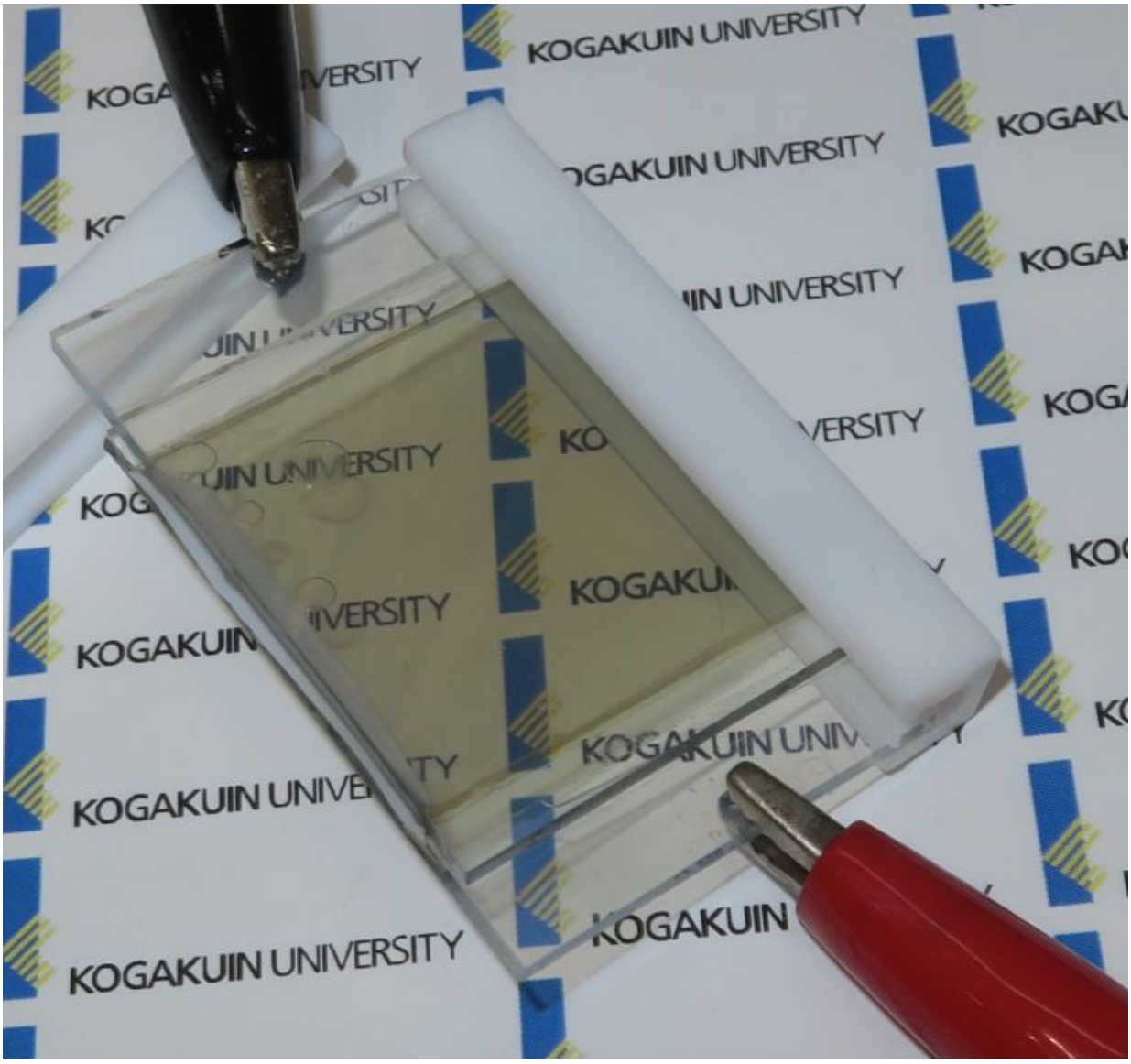

Credit: Nikkei Technology

A team of researchers with Kogakuin University has demonstrated a lithium ion battery which is not only nearly transparent, but can also be recharged with direct sunlight alone. The battery was demonstrated at Innovation Japan 2015, where the leader of the team, and president of the university explained the goals of their battery research and the benefits consumers might eventually see from it.

It was just four years ago that a team of researchers at Stanford unveiled a nearly transparent lithium-ion battery that was both see-through and bendable. The team in Japan has been working with the new technology since then, two years ago unveiling a nearly transparent battery of their own which was charged with a separate solar panel. Now, the team has upgraded that battery by allowing it to recharge itself when exposed to sunlight.

To make the new battery, the team tweaked the materials that were already in use—lithium iron phosphate for the positive electrode and lithium titanate and lithium hexafluorophosphate for the negative electrode—all ingredients that are already generally used to make lithium-ion batteries. When the battery is exposed to sunlight, it becomes slightly tinted (down to approximately 30 percent transmittance), lowering the amount of light that can pass through. The trick in getting them to be nearly transparent is in making them really thin—the electrodes are just 80nm and 90nm. After discharge, the team reports that light transmittance rises to approximately 60 percent. They also report output from the battery of 3.6V.

The team believes their transparent solar charged batteries could one day be used as "smart" windows for homes or offices, allowing for not only automatic tinting, but as energy capture and storage devices for use in a variety of ways. Taking the concept further, it is possible the idea could

be extended at some point to consumer electronics, with displays or even entire casings made of the material to help keep phones, tablets and other gear operating when used outdoors or under other types of lighting. But first the new technology will have to be vetted to make sure it works as promised (it has been tested at 20 charge/discharges) and then to see if it can stand up to the rigors of daily use.

More information: via Nikkei Technology