BRÜCKNER MASCHINENBAU

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Brückner to take part in the race for solid state batteries

Lithium-Ion batteries (LIBs) have been around since the early 1990's. But it is only recently that they became world-famous for being an enabler of electric mobility and the conversion from fossil to renewable energy. These batteries comprise a liquid that shuttles ions through a semi-permeable polymer membrane called "separator" during charge and discharge. Brückner's machine concepts are already serving this fast growing industry with production lines for biaxially stretched polyethylene separators. Despite its maturity though, LIBs are facing issues related to their volatile liquid components that the industry would like to overcome.

For almost as long as lithium-ion technology exists, researchers have been working on the next generation of lithium batteries – one that does not need any liquids, is safer, cheaper and more powerful. The "holy grail" of lithium technology: Solid-state batteries (SSB) using metallic lithium. They can be found on roadmaps of literally every OEM but the time of market readiness is deferred year by year.

Reasons are manifold – from poor interfaces and low power to insufficient ionic conductivity and limited stability of materials. So far, no large-scale production of solid-state batteries has been demonstrated.

Backed by a publically funded project called "ProFeLi" (03XP0184F), Brückner will focus on the processability of solid polymer electrolytes. The project is sponsored by the Federal Ministry of Education and Research and looking at solid-state technology from two perspectives: I) Material: necessary properties to enable a SSB II) Process: what setup is required to successfully produce SSB on an economical scale. New material combinations as well as specifications for production lines will be derived.

Brückner's stretching technology has been a part of current lithium-ion technology and will strive to become a relevant part of solid-state lithium technology in the future – with the help of a potent consortium and a federal financial support.

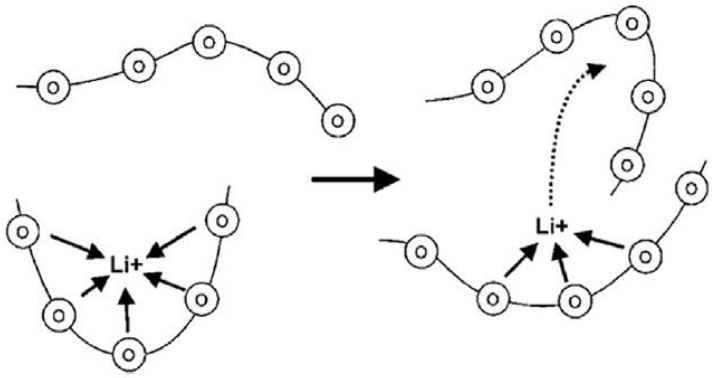

Fig. 1 – Ion transport in polymer electrolyte from: Ibrahim, S., Yassin, M.M., Ahmad, R. et al. Ionics (2011) 17: 399.

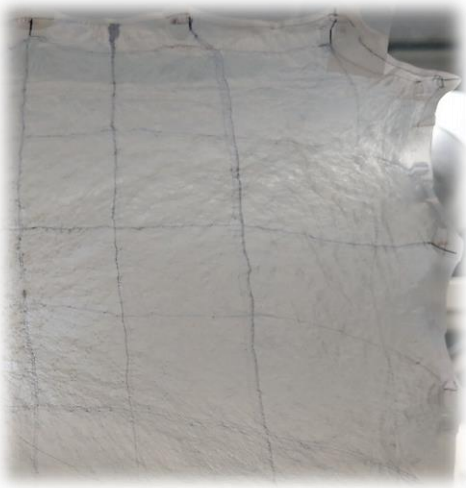

Fig. 2 – Stretched polymer film by Brückner.

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