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Combining SEM and broad ion beam milling to better understand battery materials

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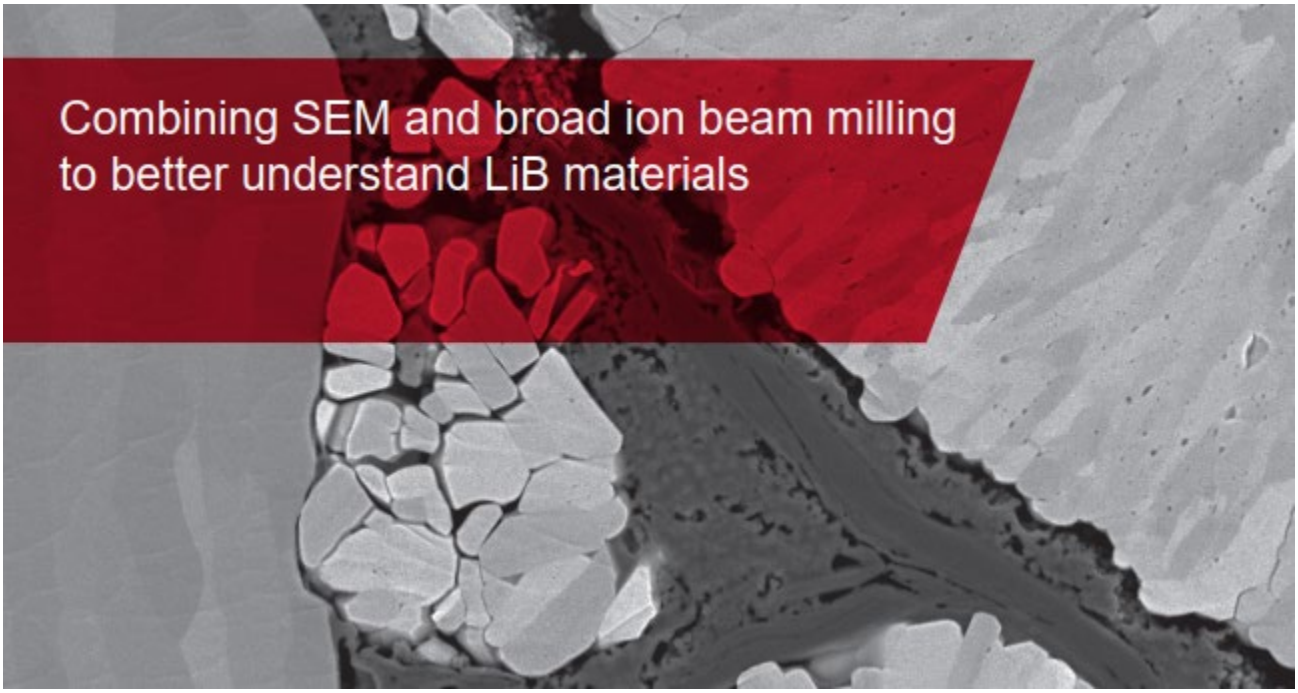
Abstract



The growing urgency to decarbonise energy supply and storage is driving the development of new battery technologies, including Lithium ion based devices (LiB).

Scanning Electron Microscopy (SEM) is a frequently used technique for the structural and chemical analysis of battery materials, both in R&D and in failure analysis. Preparing and analyzing these devices and materials, however, is not always straightforward and it can be difficult to attain a true understanding of the structure and properties without careful preparation.

This presentation describes workflows and instrumentation which can significantly improve the understanding of battery materials - enabling researchers to improve battery performance and lifetime. In-particular, it describes how broad Ar^+ ion milling can be used

to generate high quality cross-sections through battery components including raw powder material, electrodes, separators or complete devices. It also describes techniques for subsequent imaging and compositional analysis, including workflows for handling oxidation or humidity sensitive materials.

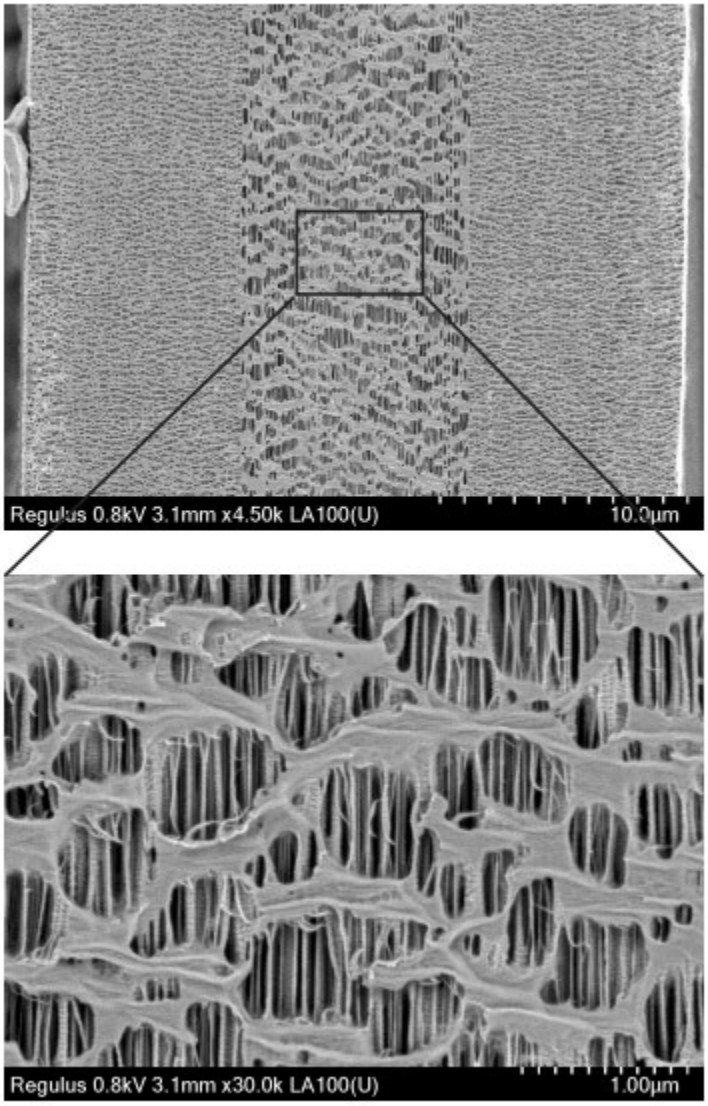


Fig 6 Cryo BIB cross-section of PP/PE/PP separator foil