**Porous Membranes from Electrospinning: A Game Changer for Battery Technology**

Nowadays, metal-ion batteries (MIBs), including lithium-ion batteries (LIBs) and zinc-ion batteries (ZIBs), power our recent world. Therefore, their performance and safety are rigorously concerned. One key component, the separator, plays an important role. Traditional separators are microporous membranes, but researchers are looking towards electrospun nanofibrous membranes for their potential to revolutionize battery technology.

Porous membranes are generated by utilizing a versatile technique called “Electrospinning” which transforms the polymer solution into ultrafine fibers. These fibers self-assemble into a non-woven mat, resulting in a highly porous membrane with a large surface area. Moreover, the diverse and modifiable structure of polymer materials provides high-performance polymer precursors, such as functional groups or effective particles, for improving the ionic conductivity and stability of membranes. This unique structure makes electrospun membranes ideal candidates for next-generation battery separators and polymer electrolytes.

Researchers are actively addressing these challenges by exploring novel polymer materials and composites, incorporating functional additives, ionic conducting particles and developing innovative electrospinning techniques. With continued research and development, electrospun membranes have the potential to revolutionize battery technology, paving the way for safer, higher-performance MIBs for the future.

A close-up of a machine

Description automatically generated