Empa
Materials Science and Technology

Electrospinning is a versatile technique to produce functional nano-fibrous membranes from a range of materials under ambient conditions. Contrary to ever-tightening regulations however, sustainable polymers, solvents and additives are currently not a focus of industrial electrospinning.

Sustainable «Green» Electrospun Membranes

Concept: Sustainability as a synergy between bio-based and biodegradable materials.

Sustainable «Green» Electrospun Membranes

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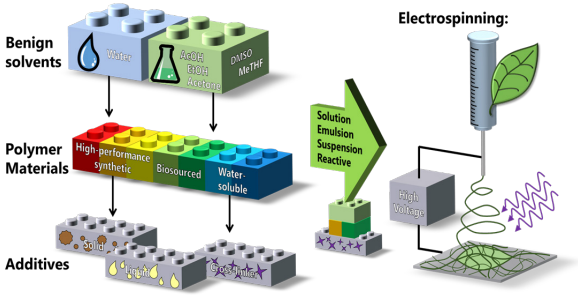

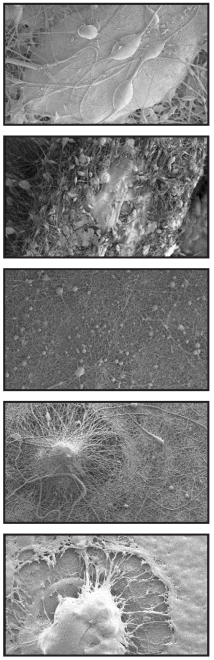

1. Electrospinning: Nanofibrous nonwovens from polymer solutions
2. Pilot-scale: continuous roll-to-roll process (up to 2.5 m width)
3. Penetration of air and water vapor; barrier to bacteria and liquids
4. Sustainability (bio-sourced/-degradable) and versatility (virtually every polymer)
5. Functionality

• Additives	> Increased/decreased degradation
• Encapsulation of particles/liquids/dyes	> Catalysis, agriculture, fashion
• Slow release of volatiles or biomolecules	> Cosmetics, agriculture, medicine
• Biocompatibility, air permeability	> Tissue scaffolds, artificial skin
• Electrostatic, hydro-/lipophobic, transparent	> Filters/masks, protective coatings

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