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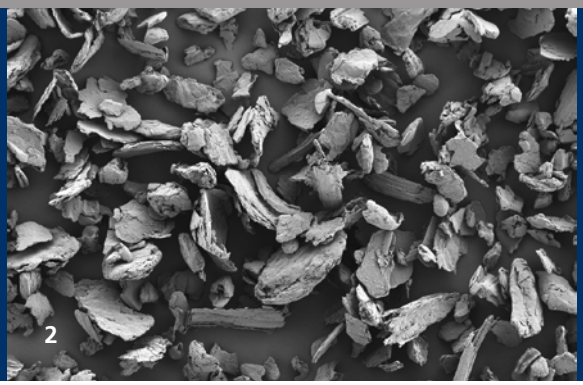
FRAUNHOFER INSTITUTE FOR CHEMICAL TECHNOLOGY



1 *Polymeric bipolar plates.*
2 *FE-SEM image of graphite particles.*

DEVELOPMENT AND CHARACTERIZATION OF BIPOLAR PLATES

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Fraunhofer ICT works on the development and the characterization of bipolar plates for energy conversion and energy storage applications. Bipolar plates are generally made of electrically conductive polymer composites or corrosion protected metals. According to universal testing standards the properties of the materials produced are analyzed and the bipolar plates are evaluated for use in fuel cells, electrolyzers or redox-flow batteries.

Our offer

- Laboratory-scale research on material combinations and the up-scale production of bipolar plates/electrically conductive composites via twin-screw extruders, injection and compression molding
- Spectroscopic analyses of bipolar plates with Raman microscopy (RAMAN mapping), IR spectroscopy, scanning electron microscopy and X-ray photoelectron spectroscopy (XPS)
- Galvanostatic charge-discharge tests to evaluate structured (with channels) and unstructured bipolar plates in all-vanadium redox-flow batteries.
- Electrical conductivity measurements (2-point, 4-point and through-plane)
- Mechanical tests: determination of
  - flexural properties (ISO 178)
  - the fluidity of plastics using capillary and slit-die rheometers (ISO 11443)
  - charpy impact properties (ISO 179-1)
- Corrosions investigations on planar coated or uncoated electrically conductive materials
  - Ex-Situ in a temperature-controlled 3-electrode setup
  - In-situ investigation of the surface through an optical microscope during potentiodynamic or cyclic voltammetry measurements in a flow-through cell
  - Surface modification through anodic oxidation or electro-polishing metallic substrates