



SPECIAL SESSION XXXI

Electrolyte & Electrode Membranes for Electrochemical Energy Storage Devices

ORGANIZED AND CHAIRED BY

- **Giovanni Battista Appetecchi** [gianni.appetecchi@enea.it]
ENEA (TERIN-DEC-ACEL), Rome, Italy
- **Antonio Rinaldi** [antonio.rinaldi@enea.it]
ENEA (TERIN-DEC-ACEL), Rome, Italy

Electrochemical energy storage systems can successfully exploit beneficial characteristics of electrolyte and/or electrode membranes due to their intriguing peculiarities that make them well-established, standard components in innovative devices able to match different and, often, challenging operative conditions. Therefore, an increasing number of researchers is attracted by these topical issues.

Electrolyte membranes play a key role not only in the performance, but especially in safety and reliability of the device, e.g., often preventing the development and commercialization. One of the most promising approaches to overcome these limitations is the adoption of ionically-conducting, solid (polymer, ceramic, hybrid) electrolyte membranes (PEMs). Additionally, the development of PEMs is undoubtedly appealing from the engineering point of views. These components can be easily and cheaply manufactured, including upscaling, into low thicknesses and shapes not easily achievable for supported liquid electrolytes, offering a new concept of all-solid-state, thin-layer, flexible (both mechanically and in design), robust, battery device.

Electrode chemistry and formulation are critical for the electrochemical device performance. For instance, electrodes have also to include passive components which, even if not affecting the energy density, strongly influence the power density, cycling behaviour, and reliability of the device. Therefore, although well-known over time, these issues are currently under deep investigation worldwide.

Recycling and re-use of recycled materials in remanufacturing batteries are in scope.

This Special Session offers scientists and readers an appealing forum to bring and summarize the forthcoming research & development results obtained for electrolyte/electrode membranes to be tailored for electrochemical energy storage devices.

Topics of interest include, but are not limited to:

- **Synthesis/preparation of innovative electrolyte/electrode membranes**
- **Investigation of physicochemical and electrochemical properties**
- **Behaviour/phenomena at electrolyte/electrode interface**
- **Prototype manufacturing**
- **Upscaling of fabrication processes**