Politecnico di Torino

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SUSTAINABLE MATERIALS, PROCESSES AND SYSTEMS FOR ENERGY TRANSITION

DM 630 - FIB S.p.A. - Analyses of batteries with advanced analytical techniques: from raw material to electrodes and cells

Funded By	Ministero dell'Università e della Ricerca - MUR [P.iva/CF:96446770586] Politecnico di TORINO [P.iva/CF:00518460019] FIB S.P.A. [P.iva/CF:03866680618]
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Context of the research activity	Energy-related research is a flourishing, yet challenging field in modern-day science. In the battery field, every component of the cell has to be designed, tested, possible problems identified, optimized, and tested again in a cycle until either satisfactory results are reached or the reason behind the failure is identified. For this purpose, advanced structural characterization of the materials is necessary. X-ray-based methods, also in operando modality, offer the possibility to disclose the structure-property relationship and identify ill-performance of material, electrodes, and cells. Progetto finanziato dal PNRR a valere sul DM 630/2024 - CUP: E14D24002340004
Objectives	The objectives of this PhD are: i) to characterize raw materials as a active material for the slurry ii) to process electrodes and assemble half and full cells and perform the electrochemical testing; iii) to design, propose and adapt the most useful advanced analytical techniques for the analysis of Li-ion and Na-ion battery, identifying properties and failure mechanism; iV) to perform operando characterization of the cell by adopting a multi-techniques approach to investigate reaction mechanisms in batteries and to shed light to their evolution/modification during their operativity.
Skills and competencies	The ideal candidate should be a material scientist or engineer, chemist, physicist or chemical engineer. Expertise in electrochemistry, and advanced processes as well as problem solving ability and practical experience in the

for the development of the activity	processes as well as problem-solving ability and practical experience in the laboratory would be an additional value. The applicant should have a strong motivation to work in an international environment and act a bridge between industry and academia