

SUSTAINABLE MATERIALS, PROCESSES AND SYSTEMS FOR ENERGY TRANSITION

IIT - ADVANCED and IN-OPERANDO characterization of catalysts for key reactions (CO₂RR, CORR, HER, OER, ORR) in the energetic transition

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Supervisor	LAMBERTI ANDREA - andrea.lamberti@polito.it
Contact	Fontana Marco Angelica Chiodoni, IIT Katarzyna Bejtka, IIT
Context of the research activity	<p>In order to achieve the ambitious targets set up in Paris (December 2015) by the COP21 assembly of 195 Countries to cope with the global warming effect, of cutting-edge technologies are currently under development. Among the others, future generations of processes and systems aimed</p> <ul style="list-style-type: none">(i) to ensure the reduction of anthropic carbon dioxide through capture, storage and valorization,(ii) to develop technologies for hydrogen production, storage and use, and(iii) to improve the efficiency in the use of renewable feedstocks within a circular economy perspective, should be investigated. <p>All these aspects can be faced by investigating the reaction mechanisms and the correlation between structural and functional properties of catalysts for the key reactions (CO₂RR, CORR, HER, OER, ORR) involved in the framework of the energetic transition.</p>
Objectives	<p>The objectives of this PhD are:</p> <ul style="list-style-type: none">- Assessment of protocols for sample preparation- Characterization of catalysts for the key reactions (CO₂RR, CORR, HER, OER, ORR) to assess their structural and morphological properties- In-situ and in-operando characterization of the catalysts with multiple techniques to investigate the reaction mechanisms and to shed light to their evolution/modification during the catalytic activity <p>For further information, please contact: angelica.chiodoni@iit.it</p>
Skills and competencies for the	<p>The ideal candidate should be a material scientist or engineer, chemical or physical engineer, a chemist or a physicist or equivalent degree. Expertise in electrochemistry, advanced processes and nanotechnologies, as well as problem solving ability and practical experience in laboratory</p>

**development of
the activity**

would be an additional value.

Candidates should have a strong motivation to learn through advanced research.