



2023年4月XX日

ERASMUS+ Mobility
between Hokkaido University and Politecnico di Torino
特別講演会

(共催： 日本機械学会第40回バイオメカニクス懇話会，日本機械学会北海道支部，
化学工学会北海道支部)

下記の要領にて特別講演会を開催いたします。皆様のご参加をお待ちしております。

記

日 時：2023年4月27日（木），14:30～15:30

場 所：北海道大学工学部材料化学研究棟 MC204 室

講 演：「**Platinum-free sustainable electrocatalysts for low temperature fuel cell applications**」

Prof. Stefania Specchia, Dept. of Applied Science and Technology, Gre.En² Group, Politecnico di Torino, Torino, Italy

Abstract: Fuel cells are devices that efficiently convert the chemical energy of a fuel into electrical energy via electrochemical reactions. Among the wide variety of fuel cell types, low temperature fuel cells (PEMFC and AEMFC) are promising for transportation, and portable applications since they operate close to ambient conditions. The main drawbacks of low temperature fuel cells are represented by the use of costly Pt-based catalysts at both the anode and the cathode, and in particular the sluggish oxygen reduction reaction (ORR) at the cathode side. Among several types of catalysts for ORR, the most promising alternative to Pt until now are carbonaceous materials doped with N and transition metals (mostly Fe, Co). This lecture will address the main synthesis techniques adopted for the production of Fe-N-C catalysts, included the use of biomass in a circular economy perspective.

Short Bio:

Stefania Specchia, Chemical Engineer, Full Professor of Chemical Plants Design. Associated Research at the CNR-ITAE “Nicola Giordano” (Italy). Lecturer of two courses: Design of Multiphase Apparatuses and Electrochemical Power Sources. Editor of Chemical Engineering Journal (Elsevier) and Electrochemical Energy Reviews (Springer). She authored/co-authored 138 peer-reviewed publications on international journals, 8 chapters of international books, 1 international patent (on Scopus database: Hirsch index equal to 43, 4790 citations). She attended 77 international congresses (26 as invited keynote). Research activities: she is the leader of the Gre.En² Group (Green Energy & Engineering Group). Main research topics: 1. Catalytic combustion of light hydrocarbons in lean conditions; 2. Hydrogen production in fuel processors; 3. Low-temperature fuel cells (PEMFC and DMFC); 4. Energetic valorization of wastes. She is/was the principal investigator of EU and national research projects, and various international cooperation (overall funding: 1.37 M€).



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