Politecnico di Torino

Finanziato dall'Unione europea NextGenerationEU

SUSTAINABLE MATERIALS, PROCESSES AND SYSTEMS FOR ENERGY TRANSITION

DM 352 - PHOTOELECTROCHEMICAL DEVICES BASED ON POLYMERIC MATERIALS

Funded By	UNIVERSITA' DEGLI STUDI DEL PIEMONTE ORIENTALE [P.iva/CF:01943490027] MINISTERO DELL'UNIVERSITA' E DELLA RICERCA [P.iva/CF:97429780584]
Supervisor	LAMBERTI ANDREA - andrea.lamberti@polito.it
Contact	Leonardo Marchese, DISIT – UPO, leonardo.marchese@uniupo.it Julio Abusleme, SOLVAY, julio.abusleme@solvay.com LAMBERTI ANDREA - andrea.lamberti@polito.it
Context of the research activity	The research activity will be based on the development of novel polymeric materials suitable to improve the performances of photoelectrochemical devices.
Objectives	Scholarship funded in the frame of DM 352/2022 by Università del Piemonte Orientale/MUR/Solvay Specialty Polymers Italy SpA CUP: E12B22000920005 Main seats to carry out the research: Department of Science and Technological Innovation (DiSIT – UPO) - Alessandria; Applied Science and Technology Department (DISAT – POLITO) - Torino; Solvay Specialty Polymers Italy Supervisors: Leonardo Marchese, DISIT – UPO, leonardo.marchese@uniupo.it Andrea Lamberti, DISAT – POLITO, andrea.lamberti@polito.it Julio Abusleme, SOLVAY, julio.abusleme@solvay.com In the frame of the sustainability and renewable energetic resources, this doctorate has the main scope of re-designing the DSSC or Graetzel cells introducing new concepts of polymer chemistry rendering these photovoltaic cells a reliable and valid option for providing energy. A deep understanding of the mechanisms involved in the cell is required. This full knowledge should liberate new ideas to improve the functioning of the cell by introducing fluorinated polymers in the construction of the same to improve reliability and lifetime. As well-known these polymers are characterized by having a long

	lifetime which help to preserve in general systems that are protected by them. For example, the protection of the dye used in the cells tends with time to lose its efficiency. This is a main obstacle for the expansion of this technology in the market of renewable energy devices. Another point is how to optimize the electronic transport in the cell making it also durable and reliable with time. Moreover, during the work, it will be explored the use of fluorinated polymers for other photovoltaic devices.

Skills and competencies for the development of the activity	The candidate should be preferrably graduated in Material Science courses, Chemistry or Industrial Chemistry and Engineering.