POLITECNICO DI MILANO

PhD in CHIMICA INDUSTRIALE E INGEGNERIA CHIMICA / INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING - 38th cycle

THEMATIC Research Field: CATALYTIC VALORIZATION OF WASTE INTO VALUE-ADDED CHEMICALS, FUELS, AND PHARMACEUTICALS

Monthly net income of PhDscholarship (max 36 months)
€ 1325.0 In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	The project focuses on designing **catalytic processes that convert waste chemicals (CO_2, plastic waste, or simply waste biomass molecules) into value-added products such as pharmaceuticals, agrochemicals, and biofuels**. Advanced in situ and in operando methods will be exploited to characterize the materials under reaction conditions, and unlock structure-function relationships. The PhD project has received **European funding** and is part of the **EU Green Deal** objectives. This project (?Green Pharmaceuticals?) intends to design new catalytic processes for the synthesis of small molecules under continuous and circular conditions. It aims to move towards a sustainable pharmaceutical industry and improve the European readiness for sustainable production of small molecules (active pharmaceutical ingredients, APIs) that have environmental or supply concerns. The new group member is expected to have a solid background in chemical engineering, industrial chemistry, or chemistry, and have gained an experimentally driven experience on catalysis in its broadest definition (heterogeneous, homogeneous, enzymatic).
Methods and techniques that will be developed and used to carry out the research	The PhD candidate will develop and use: - Research methods in catalyst synthesis, catalyst characterization, microkinetic, and catalyst evaluation.

	- Writing skills.Soft skills (presentations to scientific conferences and symposia)
Educational objectives	The PhD candidate will acquire a broad knowledge of modern chemical engineering methods. It is expected that the candidate remains active in the scientific fields through publications as first author, and participation to conferences. The duration of the PhD fellowships is for 3 years. Several exchange periods abroad (**Max Planck Institute**, **ETH Zurich**, **EPFL Lausanne**, and **University of Cambridge**) or in industry (**Idorsia Pharmaceuticals**, **Dompè**, **VITO**, **ENI**, or **C2Cat**) are part of the fellowships.
Job opportunities	Job opportunities within the chemical and pharmaceutical sectors, such as: - lab head and research scientist/research director; - process manager; - project leaders; - technology consultant.
Composition of the research group	0 Full Professors 0 Associated Professors 2 Assistant Professors 2 PhD Students
Name of the research directors	Prof. Gianvito Vilé

Contacts
Telephone: +39 02 2399 3036 Email: gianvito.vile@polimi.it Webpage of the research group: vile-researchgroup.com

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	--
Housing - Out-of-town residents (more than 80Km out of Milano)	--

Scholarship Increase for a period abroad	
Amount monthly	662.5 €
By number of months	6

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information
The student will receive additional funding for: - **Educational activities** (for participation in courses, summer schools, workshops and conferences) - **Teaching assistantship** (in recognition of supporting teaching activities by the PhD student) **- Scientific accomplishments** (in the form of a bonus, based on the results and number of high-impact publications)