

CHEMICAL PLANTS



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The main investigation pathways of the research group are:

- 1) thermochemical solar energy storage processes;
- 2) biomass thermo-conversion processes (e.g., pyrolysis, gasification, hydrothermal liquefaction) to produce energy vectors (e.g., hydrogen, methane);
- 3) purification of liquid and gaseous streams from pollutants and greenhouse agents (e.g., carbon dioxide);
- 4) liquid-solid and gas-solid adsorption processes;
- 5) synthesis of innovative/eco-sustainable binders;
- 6) re-use of solid wastes of different nature;
- 7) chemical processes in fluidised bed reactors;
- 8) design and modelling of chemical reactors and plants, with related transport phenomena;
- 9) fractal dynamics in heterogeneous processes.

Main current research projects:

- PRIN "reThebes – Rechargeable thermochemical energy battery for energy storage from renewable sources";
- PNRR "Network 4 energy sustainable transition – NEST";
- PNRR "National center for sustainable mobility – MOST";
- FRA "EPIC – Eco-sustainable production of biofuels from the conversion of sludges through hydrothermal liquefaction".

Main international cooperations (shortlist):

- CIRCE-University of Zaragoza, Spain;
- Empa, Swiss Federal Laboratories for Materials Science and Technology, Dübendorf, Switzerland;
- Institute of Chemical, Environmental and Bioscience Engineering, TU Wien, Austria;
- Department of Chemistry, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran;
- Department of Chemical Engineering, Ferdowsi University of Mashhad, Iran;
- Biopharmaceutical and Pharmacotechnical Laboratory, Ferhat Abbas Setif 1 University, Algeria.

Detailed information on research and teaching activities is retrievable at:

www.docenti.unina.it/fabio.montagnaro and www.docenti.unina.it/marco.balsamo (section "curriculum", where the vitae/profiles, with recognitions, of the research group members are constantly updated).

