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FOR THE NANO WORLD ...

## Seminar

**Dr. Giuseppe BARBIERI**

**Institute on Membrane Technology –  
National Research Council ( ITM-CNR), Italy**

## **Membrane gas separation**

The scientific community devoted and is dedicating a huge effort in development of new materials for membranes in applying to separate gases, in improving their temperature resistance and stability to the various molecules present in real streams. Finding solutions for better operating these membranes in the treatment of streams with the constrains typical of the industrial processes is the other side of the same medal. In this contest, a rationalization analysis of membrane separators performance is proposed. The fundamental of mass transport in dense polymeric-based membranes, a single-stage separation as unit operation, multistage solution for facing typical requests of up-stream and down-stream processing, and an integrated approach passing to a new defined dimensionless number are provided. The results offer various scenarios depending on the membrane properties (selectivity and permeance), operating conditions (feed/permeate pressures ratio) and feed flow rate and compositions; they are also discussed in comparison with specific requests of the next/final utilization of membrane-processed stream.

### **Lecturer**

Giuseppe BARBIERI research director at ITM-CNR ([www.itm.cnr.it](http://www.itm.cnr.it)), has a master degree in chemical Engineering – with honours - PhD in “Chemical and new materials technologies” and a National scientific qualification of university full professor in Chemical plants and technologies.

Main research interests are covering the fundamentals, mass transport and engineering in membrane operations for the treatment of gas, vapors, aeriform and liquid streams of industrial relevance/interest (containing, H<sub>2</sub>, CO, CO<sub>2</sub>, N<sub>2</sub>, CH<sub>4</sub>, HCs, water vapor, acid, basis, contaminant, etc.) and conversion (hydrogen production and upgrade, DME and CO<sub>2</sub> reduction, etc.)

**DATE: 12/01/2023**

**VENUE: Room C12**

**TIME: 12.00-13.30**