Nanocomposite and nanostructured membranes for gas separation

John JANSEN, CNR-ITM, Rende

Increasing concern for climate change by greenhouse gas emissions are pushing the scientific community to find solutions that will enable CO_2 capture. Membrane-based gas separation has been recognized as a potentially suitable technology to reach this aim. Two important sources of CO_2 emission are flue gas and CO_2-rich natural gas. Removal of CO_2 from these enormous gas volumes, requires highly efficient membranes with high permeability, combined with high selectivity. Over the last decade, we have studied various classes of polymeric materials for this purpose, such as ionic liquid gel membranes, polymers of intrinsic microporosity, Metal Organic Framework-based mixed matrix membranes. In this presentation we will discuss in detail the performance of the most successful materials, and the advanced analytical methods to study their gas transport properties.