

ABSTRACT:

Separation of Hydrogen from Biomass-Derived Syngas Using Polymer Membranes

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Sustainable industrial growth is based on the development of new industrial processes able to solve global important problems like greenhouse gas emissions, energy efficiency and toxic waste. The separation and valorisation of industrial gases with complex composition allows approaching sustainability by means of different routes. Process gases are composed mainly from hydrogen and carbon monoxide, which are identified as major valuable components. Hydrogen can be used as a feedstock, a fuel or an energy carrier and storage, and has many possible applications across industry, transport, power and buildings sectors. This lecture will explore the potential of polymer membrane technologies for efficient separation of hydrogen from biomass-derived syngas. This talk will also cover the recent research using a small-scale laboratory unit to verify the possibility of hydrogen separation from syngas, with a detailed focus on membrane-based technology. Real-world applications and prospects for scaling these technologies in industrial processes will also be discussed, highlighting their role in advancing green hydrogen production.