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An overview about inorganic membrane technology application in the field of hydrogen generation and purification

Nowadays, inorganic membrane technology is considered as an attracting option for the separation and purification of hydrogen, particularly in the field of fuel cells supplying. The application of inorganic membranes in membrane reactors makes feasible the chemical reaction to produce hydrogen and its simultaneous separation/purification in only one process unit, without requiring any other complementary stage. Among them, Pd and Pd-alloy membranes represent excellent systems for the purification of hydrogen rich-streams due to their special behaviors of perm-selectivity towards hydrogen with respect to all of the other gases. Unfortunately, Pd-based membranes are expensive and many efforts are still on going to combine high performance (in terms of high grade hydrogen separation) and cost effective processes. Meanwhile, Pd-based membrane reactors technology combined to biofuels exploitation is considered today really attracting to solve the issues related to the environmental pollution. It is worth noting that there is an extensive literature addressing hydrogen production through membrane reactors via reforming reactions of biofuels as renewable feed-stocks coming from biomass transformation and/or utilization. Hence, this work gives a panoramic view about the state of the art on the recent progresses about inorganic membranes and their application in membrane reactors to generate high grade hydrogen from reforming reactions.

Biography

Adolfo Iulianelli has completed his Degree in Chemical Engineering and PhD in Chemical and Material Engineering. Presently, he works at the Institute on Membrane Technology of the Italian National Research Council. He has published more than 50 articles in international scientific ISI journals, more than 20 chapters in international books, author of one patent and a book and of more than 50 papers in proceedings of national and international conferences. He is a Reviewer of more than 20 scientific ISI journals, Associate Editor of International Journal of Membrane Science & Technology, Editor of Journal of Membrane Science and Technology, Advances in Chemical Engineering and Process Technology, Journal of Fuels and Scientific World as well as serving as Guest Editor for International Journal of Hydrogen Energy.

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