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ADVANCED SYN-FUELS MANUFACTURING VIA CATALYTIC GREEN PROCESSES

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Growing concerns about environmental pollution and energy shortages have prompted new seeks in the field of chemistry and sustainable processes, for meeting human development goals while at the same time protecting the environment and preserving natural resources. On this address, European Community nations have adopted new Policies for a sustainable development, aiming to replace the fossil source and modify the traditional refinery by introducing renewable bio-feedstock. Furthermore, the utilization of CO₂ as “raw material” for the synthesis of value-added products (oils, solvents and chemicals etc.) appears one of the most promising strategic routes for a “greener economy”. To meet these goals, it become imperative the design and development of novel advanced catalytic processes and materials, timely designed for the manufacturing of efficient, safe and environmentally benign fuels starting from various feedstock's, ranging from bio-oil to carbon oxides. Many transition metals are differently active catalytic materials in the hydrogenation reactions, at temperatures between 180-360°C and pressure up to 100 bar. The chemical properties of the diverse transition elements can deeply affect the selectivity path of the hydrogenation reactions, modifying the products distribution and the hydrocarbon chain length of products. Therefore, this work is committed to ascertaining the feasibility of hydrogenation processes under simulated industrial conditions for the advanced syn-fuel production, aiming to establish the effect of the catalytic formulation on catalytic performance. Namely, a series of different catalytic formulations based on compositions of metal oxides (i.e. Cu, Zn, Zr and Ce etc.) have been proved and compared in the synthesis of green-fuels via hydro treating processes.

BIOGRAPHY

Spadaro L is Senior Researcher and qualified Professor of Industrial Chemistry. He has received his education at the Universities of Messina, Reggio Calabria, Turin and Rome, obtaining PhD and ScD in Industrial Chemistry and Chemical Engineering. He has been a Researcher of the National Research Council of Italy (CNR) and University Lecturer of several courses in Catalysis, Advanced Materials, Fuels and Renewable Energy, Green-Chemistry, Process Engineering and Chemistry since 2007. His main research activities concern with the “Design of Catalysts and Industrial Processes for Energetic and Environmental Applications”. He is the co-author of about 300 technical-scientific documents and owner of several international industrial patents.

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