

2nd Euro Global Summit and Expo on

BIOMASS AND BIOENERGY

October 12-13, 2017 London, UK

Catalytic reforming for biomass-based fuels: Progress and future perspectives

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The world networking platforms and regulations for energy sector urge to better use of the primary energy and increase significantly alternative fuels for energy production by 2030. This article describes and review recent research on potential biomass and biomass-waste derived fuels consisting of methanol, ethanol, butanol, and carboxylic acids. These fuels possess a volumetric energy densities of 15.6–22.7, 20.9–26.8, and 24.6 (levulinic acid) MJL⁻¹, respectively. Thus biomass can be recognized as a valuable, sustainable, and economic fuel source in comparison to fossil fuels. In present paper, first, we discuss, characterize, and compare all mentioned fuels. Second, we review recent research developments in the continuous pre-processing for syngas production for biofuels production, specifically concentrating on wet, dry and mixed reforming and the catalytic effects on the effluent and process efficiency. Finally, the discussion is provided regarding the future prospects and research needs to realize this technology on a global scale.

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