

Chemical Engineering

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Gold based catalyst for low temperature water-gas shift reaction

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The water-gas shift reaction (WGS) is a very important reaction in industrial processes in which CO and water in the vapor phase react to produce carbon dioxide and hydrogen. Copper based catalysts are considered to be the standard for methanol synthesis. Also currently, CuO/ZnO/Al₂O₃ (CZA) is used as the standard low temperature shift catalyst, but catalysts based on copper supported on SiO₂, MgO, and Cr₂O₃ also have been applied. The currently used industrial CZA catalysts for WGS are usually operated at 493–553 K. The reaction at lower temperature leads to the low reaction activity, while higher temperature results in the sintering of the catalysts. Recently, it has been demonstrated that supported gold catalysts are promising low temperature WGS. Au/CeZrO₄ catalysts are prepared by deposition-precipitation methods which have higher activity for the water-gas shift reaction and by using a model reaction gas mixture with Au supported on CeO₂, TiO₂ or ZrO₂. The main objective of this paper is to investigate and compare the activity of Au/CeZrO₄ and CZA catalyst for low temperature WGS.

Biography

Jehad Abu-Dahrieh is a Lecturer of Chemical Engineering at Queen's University Belfast, UK. She has done her BSc in Chemical Engineering and Technology and obtained her MSc in Chemical Engineering from Jordan University of Science. She received her PhD in Chemical Engineering from Queen's University Belfast. She also worked as a Post-doctoral Research Associate at Queen's University Belfast (2010-2014) in the group of CenTACat. Her research interests focuses on the area of heterogeneous catalysis, reaction engineering and energy.

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