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Hydrogen generation from hydrous hydrazine using Ir-based nanocatalysts

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Modern society relies on oil and hydrocarbon to satisfy its energy requirements. However, the usage of oil is depleting the world resources and increases the emission of greenhouse gases, leading to grave consequences for the whole planet. In this optics the research for new cleaner and renewable energy sources is necessary more than needed, between this hydrogen has created a lot of interest as both fuel and energy carriers. Hydrogen has an energy density three times higher than petroleum i.e., 120 kJ g^{-1}, can be released with high efficiency using fuel cell systems combined with electrical engines. Moreover, fuel cells are clean energy systems that produce only water as by-product, in this way the level of pollutant and greenhouse gases can be reduced in the atmosphere. Main drawback for hydrogen application is the need to find an efficient and safe method of transportation. From this point of view, chemical liquid storage systems like hydrazine and formic acid are really promising platform for large scale application of fuel cell system. We used iridium-based catalysts to catalyze the decomposition of hydrous hydrazine into molecular hydrogen and nitrogen. The catalyst has been prepared using different preparation methods like deposition-precipitation and sol-immobilization and bimetallic systems using other metals such as Fe and Ni. The activity of the catalysts have been measured showing promising results for the generation of H2, while the catalysts have been characterized by different techniques like TEM, XPS, SEM and CO-chemisorption.

Biography

Davide Motta is a PhD student at Cardiff University, as part of CDT in Catalysis between the University of Bath, Bristol and Cardiff University. He has done his Master's degree in Industrial Chemistry from the University of Milan in 2014 and a Master of Research in Catalysis from the Cardiff University in 2015.

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