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Electro-oxidation of ammonia on platinum nanocubes with preferential (1 0 0) surface on high surface area carbon supports

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THE GOAL is to enhance the use of ammonia as fuel via electro-oxidation with platinum supported on various high surface area carbons such as Vulcan XC-72R, Ketjenblack EC-300J and EC-600JD. It's expected that by preparing a high Pt content on these carbons the increase in specific surface area of the supporting material brings a reduction of particle agglomeration; hence, a thin catalyst layer can be fabricated to facilitate mass transportation and enhance its utilization. Pt nanocubes with preferential (1 0 0) surface sites will be synthesized in order to maximize the contact on its surface area and its catalytic activity since it has been shown that its interaction for ammonia oxidation takes place almost exclusively on surfaces with this type of symmetry. Finally, the optimized combination of platinum and carbon support will be implemented in a Direct Ammonia Fuel Cell.