Effect of Bases on Electrochemical Oxidation of Indoline

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Saturated nitrogen containing heterocycles are excellent hydrogen carriers and the use of such fuels in a proton exchange membrane (PEM) fuel cell could be a promising strategy for a new-generation direct fuel cell with zero-CO_2 emission and low fuel crossover. It is also postulated that the fuel can be dehydrogenated directly to protons and electrons and further re-hydrogenated making this type of fuel cell rechargeable and suitable for energy storage applications (Fig.1). Despite these advantages, very little is known about the electrochemical behavior of these fuels in non-aqueous solvents. This study reports the electrochemical methods used to understand the electrooxidation kinetics and possible reaction mechanisms of a model fuel, indoline. The effect of nitrogen containing bases on indoline oxidation was also studied.

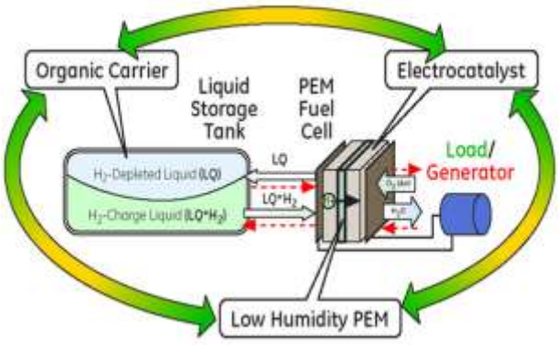

Fig.1 Concept of a reversible organic liquid fuel cell