Non Technical note

NMR- Corrosion resistant fuel cell catalyst for Acid Fuel cells (NMR-CrCAT-FC)

Product

1. 10 to 30%Pt/High surface area graphite

Fuel cells are electrochemical devices that directly convert chemical energy of fuel and oxidant in presence of electro-catalyst to electrical energy by redox process with high efficiency and zero emission. They consist of anode, cathode, electrolyte, gas diffusion layer and bipolar plates. An anode facilitates the oxidation of the fuel, while a cathode promotes the reduction of oxidant. The electrodes should be both catalytically active and conductive in nature to achieve practically useable current density. Generally Platinum and its alloy supported on carbon / graphitic materials are used to catalyze the reaction.

NMRL has developed a method for production of high surface area; high metal loading electro catalyst on graphitic support for acid fuel cells. The commercial graphitic support is modified to facilitate deposition of noble metal and to increase the durability of support and the catalyst. The electro catalyst is prepared by incipient wetness impregnation method followed reduction in controlled environment. This method is simple, practical and reproducible and effective for very rapid synthesis of highly dispersed, high loading Pt- based electro catalyst for fuel cells.

This technology gives method for preparation of 10% to 30 %Pt and on graphitic support and different carbon black supports, to achieve uniform distribution of nano platinum and particle size of 3 to 6 nm with electrochemical surface area of 60 to 80m^2/gm. The catalyst is used for acid fuel cells with pure hydrogen and oxygen/air. The process developed is simple and easily adapted for production. The TOT of NMRL - Corrosion resistant catalyst for Acid Fuel cells includes

1. Methods for qualification of supports.
2. Know how for chemical pretreatment of graphitic supports, testing and qualification.
3. Process for activation of supports, testing and qualification.
4. Solution preparation of precursors.
5. Impregnation of noble metal, reduction of metal, cleaning, analysis of metal content etc.
6. Physical characterization of catalyst.

Technology status –The technology is ready for transfer to industry, having experience in noble metal supported catalyst.

HOD, FCTD