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II DESCRIPTION

2.1 TITLE OF INVENTION: Electro-deposition of catalyst on electrodes.

2.2 DESCRIPTION

2.2.1 Introduction:

2.2.1.1 The deposition of a catalyst coating on carbon cloth during the construction of a membrane electrode assembly has hitherto, been achieved by, either brushing and or spraying slurry.

2.2.1.2 Such methods can bring about non uniform catalyst densities, over the area, thereby causing differential currents, heating, and premature failure of the Membrane Electrode Assembly (MEA), adding to lost time, energy production, frustration and production cost.

2.2.1.3 The proposed method, however achieves the above by electro-deposition, as in the case of electroplating, but incorporates finer pulsed electronic control, to ensure a more uniform layer being deposited at the correct density, by varying the average electric current, through the bath.

2.2.2 Description of Process:

2.2.2.1 Carbon powder is ground in a ball mill at high temperature. Blank carbon electrode is created and teflonised. The electrode is dried and sintered at high temperature. After sintering it is subject to hydraulic pressure. The weight of the sintered electrode is recorded.

2.2.2.2 Ground carbon powder, PTFE, Ammonium bicarbonate is mixed. Water and glycerol are added and mixed at high speed. This mixture is sprayed on carbon cloth and dried. Further drying is carried out at high temperatures. The layers are hydraulic pressed and their weight recorded.

2.2.2.3 Cut electrodes are installed in a frame are placed in a plating bath. (See *Fig 1 in drawing*). Acid and catalyst are mixed and used as the



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electrolyte (see *Fig 3 in drawing*). Electrodes with Platinum catalyst materials are used. **A pulsed current is applied for short periods but at regular intervals. Deposited electrodes are then further washed and dried.**

III CLAIMS

3.1 Variable pulse rate and width control of electro-deposition catalyst layer and its depth, is our technological development. An ability to fine control thickness of the catalyst layer. This enables the manufacture of close tolerance MEA (Membrane Electrode Assembly). Close tolerance MEA enables the fabrication of predictable quality Fuel Cells. This implies mass produced quality Fuel cells with lower costs.