

LOW INTERFACIAL RESISTANCE PROTECTION COATING FOR METALLIC ELECTRODE IN FUEL CELLS

Purpose

Fuel cells are designed to get electrical power out of hydrogen gas. In these cells, the electrodes are metallic parts which assure the collection of electrons and the circulation of gas (H_2 on one side and air on the other side). Due to water generation, presence of O_2 , high voltage and acidic compounds (from the degradation of the separator), most of metals corrode. As a consequence, the interfacial resistance between the electrode and the membrane increase as most metal oxide are dielectrics. To solve this problem, CRM Group developed electrical conductive and protective coating for the electrode to assure long term low ICR (Interfacial contact resistance) performances in the fuel cell.



Results

On the left, the black protected electrode with its gas channel to insure H_2 inlet. On the right, the same same after 240h in a fuel cell. The only difference is the change of fade due to the compression in the stack of the fuel cell.

Technical Data

A few microns protective conductive coating was developed at CRM Group. This layer provides corrosion protection in hot wet acidic conditions like in fuel cells where hydrogen molecules are oxidized into water. The conductive layer let the electron pass through with minimum resistance.