

ABSTRACT

Oxygen reduction nanocomposite electrocatalysts based on tungsten carbide with 3d-metals.

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Based on tungsten carbide modified with metallic particles of 3d-metals (Ni, Co, Fe, Zn, Cu and Mn), with the help of high-temperature synthesis, disperse nanocomposites catalytically active in the reaction of oxygen electroreduction have been obtained. With the aid of a gas diffusion «floating» electrode their electrochemical characteristics in 0,5 M H₂SO₄ solution, which simulates the acidic medium of the fuel cell with a proton-exchange membrane have been studied. On the basis of electrochemical studies and kinetic calculations show that for all oxygen reduction nanocomposites electrocatalysts based on tungsten carbide with 3d-metals the electrocatalytic activity increase in an acidic environment. It has been found that nanocomposites WC-electrocatalysts with cobalt and iron have the highest activity in the oxygen reduction reaction are. Based on the results of X-ray diffraction and scanning microscope micrographs morphology and the nature of the active centers synthesized electrocatalysts have been investigated.

OXYGEN ELECTROREDUCTION, ELECTROCATALYSIS,
ELECTROCATALYST, COMPOSITES, TUNGSTEN CARBIDE, HIGH-
TEMPERATURE SYNTHESIS.