

Abstract: Novel type of catalyst for proton exchange membrane fuel cells anode is demonstrated. It is based on magnetron sputtered Pt-CeO₂ a Pt-Sn-CeO₂ mixed oxides. It is shown, that these materials allow to significantly decrease amount of platinum in the anode catalyst. The preparation method yields high amount of platinum in ionized form, especially Pt²⁺, which is related to the high activity. Stability of these catalytic layers were investigated under conditions similar to fuel cell anode (humidified hydrogen at elevated temperature). Also interaction of hydrogen a water under UHV conditions were studied, demonstrating high stability of the Pt²⁺ species. In the last part of the work sputtered Pt-Co mixed catalyst were investigated to be used in the PEMFC cathode. It is demonstrated that at right conditions, the sputtered alloy catalyst improves mass activity on cathode by factor more than two.