Stationary and Pulsed Magnetron Sputtering Technologies for Protective/Catalyst Layer Production for PEM Systems

Olga K. Alekseeva^{*}, Elena K. Lutikova, Vladimir V. Markelov, Vladimir I. Porembsky,
Vladimir N. Fateev

National Research Center "Kurchatov Institute", Kurchatov sq., 1, Moscow, 123182, Russia

^{*}E-mail: alekseeva_ok@nrcki.ru, fateev_vn@nrcki.ru

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The results of stationary and pulsed magnetron sputtering (PMS) application for Pt deposition on titanium substrate for PEM (polymer electrolyte membrane) electrochemical devices are presented. The technology allows *in-situ* surface preparation (titanium oxide layer elimination) just before platinum deposition. Depending on the sputtering regime the coatings with various microstructure and electrochemical characteristics are produced. Operation regimes for the deposition of protective coatings preventing from saturation with hydrogen and surface oxidation/corrosion and also for the deposition of catalytically active layers are selected. The coatings were tested in sulfuric acid solutions (model conditions) and in PEM electrochemical cell (unitized regenerative fuel cell).

Keywords: Platinum coating; Pulsed magnetron sputtering; PEM electrochemical devices.

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