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Electrochemical properties of Pt-Co-Zr thin films on high surface area NSTF supports CHARLES HAYS, POYAN BAHRAMI, MICHAEL ERRICO, JAMES KULLECK, DANIEL KONOPKA, ADAM KISOR, STUART COOLEY, HAROLD GREER, California Institute of Technology, Jet Propulsion Laboratory — Nanostructured thin film supports (NSTF) are a promising fuel cell (FC) technology demonstrated by 3M [1]. We have examined the electrochemical performance of Pt-Co-Zr films deposited onto NSTF supports by dc-magnetron sputtering. In this presentation, we will present results of microstructural, composition, and electrochemical properties, for NSTF supported $(Pt_3Co)_{100-x}Zr_x$ thin films, with $10 < x < 40$ (At. %). Electrochemical measurements show that the films are electrochemically stable, and active for the oxygen-reduction-reaction (ORR), with ORR kinetic current densities at 0.9 V (vs. NHE), up to 57X greater than those of Pt(111) films measured in the same cell. The composition dependence of the ORR, and relevant physical properties will be discussed.

[1] M. K. Debe, A. J. Steinbach, G. D. Vernstrom et al, J. Electrochemical Soc. 158, B910 (2011).

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