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Understanding the electronic band structure of Pt-alloys for surface reactivity JONGKEUN JUNG, Seoul Natl Univ, BEOMYOUNG KIM, Lawrence Berkeley National Laboratory, JI SOOK HONG, TAE WON JIN, JI HOON SHIM, Postech, SLAVOMIR NEMSAK, BESSY II, JONATHAN D. DENLINGER, Lawrence Berkeley National Laboratory, ARITA MASASHI, SHIMADA KENYA, Hiroshima Synchrotron Radiation Center, CHANGYOUNG KIM, Seoul Natl Univ, BONGJIN SIMON MUN, GIST — In polymer exchange membrane fuel cell (PEMFC), the oxygen reduction reaction (ORR) at cathode side has been continuously investigated due to its critical importance in performance of fuel cell. So far, even with best industrial catalyst made with Pt, the performance of ORR is too far below from the commercial purpose. In 2007, Stamenkovic et al. showed that Pt alloys with 3-*d*-transition metal exhibited significantly improved ORR performance and pointed out the altered electronic structure of surface as the major contributing factor for enhanced ORR. Since 1990, with the advance of DFT calculation, the trend of surface chemical reactivity is explained with the analysis of *d*-band structures, known as *d*-band model. While *d*-band provides valid insight on surface chemical reactivity based on the valence band DOS, the relation between surface work function and DOS has not been well understood. The element-specific local electronic band structure of Pt alloys are identified by ARPES measurement, and the correlation between surface work function and local charge density is investigated.

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