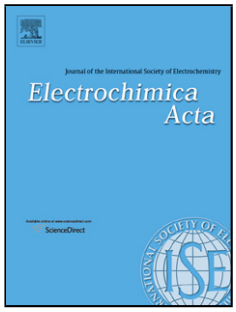

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Nanoporous PtPd Alloy Electrocatalysts with High Activity and Stability toward Oxygen Reduction Reaction

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ABSTRACT

Nanoporous (NP) PtPd alloys with three different bimetallic ratios are straightforwardly fabricated by one–step mild dealloying of PtPdAl precursor alloys in alkaline solution. These as–prepared PtPd alloys are comprised of nanoscaled bicontinuous network skeletons and interconnected hollow channels extending in all three dimensions with uniform ligament size around 5 nm. Compared with commercial Pt/C, NP–Pd, and NP–Pt catalysts, NP–PtPd alloys exhibit superior electrocatalytic activities toward oxygen reduction reaction (ORR) with much higher specific and mass activities. More importantly, NP–PtPd alloys also show superior structure stability with almost no ORR activity loss upon long–term potential scan compared with Pt/C catalyst. The ORR performance follows the order of NP–$Pt_{75}Pd_{25}$ > NP–$Pt_{20}Pd_{80}$ > NP–$Pt_{50}Pd_{50}$ > NP–Pt > Pt/C > NP–Pd. NP–PtPd alloys hold great application potential as