

## Non-Precious Oxygen Reduction Reaction Catalyst Based on Porphyrin Metal–Organic Frameworks

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The slow oxygen reduction reaction (ORR) kinetics in proton exchange membrane fuel cell (PEMFC) causes requirement of undesired precious platinum catalyst on cathode electrode. The efforts to replace platinum catalyst to non-precious and abundant metal catalyst have continued up to now. Metal-organic frameworks (MOFs), consisting of organic building block and metal or metal-cluster secondary building units (SBUs), have emerged as a promising alternative to conventional ORR catalyst because of their densely populated metal-active sites and extremely high surface area. We, herein, report the non-precious ORR catalyst based on metallo-porphyrin MOFs which have high density of transition-metal-nitrogen coordination sites.