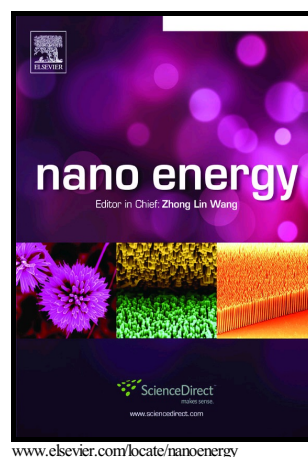


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A facile surface chemistry approach to bifunctional excellence for perovskite electrocatalysis

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Abstract

Cost-effective energy storage and conversion require robust, earth-abundant electrocatalysts for oxygen reduction and oxygen evolution reactions (ORR and OER). Perovskites are emerging as a new research frontier for oxygen electrocatalysis, yet lack the equivalent activity to noble metals. Herein, we report an easy-to-use surface chemistry approach to activating the perovskite electrocatalysis of both ORR and OER. Using this approach, we exemplify that a perovskite oxide, such as $\text{La}_{0.45}\text{Sr}_{0.45}\text{Mn}_{0.9}\text{Fe}_{0.1}\text{O}_{3-\delta}$, could be engineered into a three-components-integrated catalyst (*i.e.*, $\text{LaSrMnO}/\text{Fe}_3\text{C}/\text{Carbon}$). Building on this, we present an efficient, affordable, tunable and robust catalyst that enables several folds enhanced activities for ORR and OER and thus achieves the best of both worlds. More generally, such a methodology provides a convenient route to boost a variety of perovskite oxide materials for

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