

High entropy alloy phenolic network with stable bifunctional electrocatalyst for oxygen evolution and reduction

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Oxygen evolution reaction and oxygen reduction reaction act as vital roles in next generation energy such as metal air battery, water splitting and fuel cells. However, OER and ORR require very high overpotentials due to complex electron transfer process and commercial electrodes which mainly consist of precious metals are too expensive to get sustainable energy supply. To overcome these problems, High entropy alloys (HEAs), which consists of five or more metal elements, can be a powerful solution. By chelating with tannic acid, We successfully synthesized high entropy alloy phenolic network without any noble metals. Furthermore, using the tannic acid-carbon nanotube chemical bonding, CNT free standing electrode is also fabricated without any binder or substrate. Its showed OER overpotential in alkaline solution as 227mV vs RHE and high durability as well as good performance in ORR activity.