Material Technology

R&D Endorsement

Title

A New Electrocatalyst for High Performance Oxygen Evolution Reaction and Overall Water Splitting: High Entropy Glycerate

Abstract	We have invented a new high-entropy material, which is synthesized by a simple solvothermal method non-noble metal high-entropy glyceride (HEG). HEG consists of iron, nickel, cobalt, chromium, and manganese. The unique glyceride structure exhibits excellent oxygen production activity and extremely low overpotential at a specific current density in 1M KOH electrolyte, which is superior to other binary, ternary, and quaternary systems. HEG also shows excellent stability and durability in alkaline electrolytes. In addition, the HEG@HEG electrolyzer exhibits excellent overall water-splitting performance and durability and is expected to be applied in the fields of hydrogen energy and oxygen energy.
Benefits	Current technology: Excellent OER activity with a low overpotential of 230 and 327 mV at current densities of 10 and 100 mA cm-2, respectively, in a 1M KOH electrolyte, outperforming its subsystems of binary-, ternary- and quaternary-metal glycerates. The HEG also shows outstanding stability and durability HEG@HEG electrolyzer shows excellent overall water splitting performance and durability, requiring a cell voltage of 1.63 V to achieve a current density of 10 mA cm-2. Problems and defects of prior technologies: Excellent OER activity with a low overpotential of 230 and 327 mV at current densities of 10 and 100 mA cm-2, respectively, in a 1M KOH electrolyte, outperforming reported unary and binary glyceratescurrent
Industry Categories	Chemical raw materials, electronic components manufacturing, Electric power equipment, and configuration manufacturing industry, non-metallic mineral product manufacturing industry
Keywords	High entropy glycerates, oxygen evolution reaction, electrocatalysts
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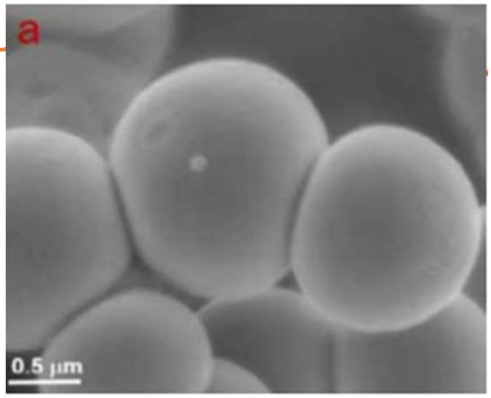

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