

## A novel sandwich 3D structure of layered double hydroxide and mixed transition metals toward water splitting

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### Abstract

**E**lectrochemical water splitting by low-cost non-noble transition metals have attracted significant interest in recent years. However, single metal electrodes suffer from low electrocatalytic activity. Therefore, exploiting mix-metal strategy and benefiting from synergistic role of different transition metals seems to be a suitable approach. We present, for the first time, a sulfurized ternary mixed transition metal (Ni-Co-Fe) layer on Ni foam with robust electrocatalytic activity toward oxygen evolution reaction (OER). Ni-Co-Fe LDH electrodeposited on Ni foam and followed a final solvothermal process for sulfurization. To further improve the electrochemical activity, a NiFe layered double hydroxide have been electrodeposited on NiCoFe-S/Ni foam. Electrochemical measurements exhibited high OER performance of the NiFe/NiCoFe-S/Ni foam sandwich structure. The developed procedure provides a new approach for combining efficient structures of transition metals for a highly active electrocatalyst toward water splitting.



### Biography:

A. Simchi received PhD (1999) with the highest rank from the Materials Science and Engineering Department at Sharif University of Technology (SUT, I.R.Iran). He holds the rank of Distinguished Professor at SUT and Distinguished Researcher in Engineering Sciences at national level. He has acquired more than five years international work experiences in a capacity of Visiting Professor and Academic Visitor in accredited universities and institutes including University of Toronto (Toronto, Canada), Imperial College London (London, UK) and Max-Planck Institute (Potsdam, Germany). He has been the author and co-author of three books, two book chapters, five patents, and over 325 papers which have been cited many times (~9051), giving him a h-index of 49.

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