

## SBA-15 Templated Mesoporous NiFe<sub>2</sub>O<sub>4</sub>/MXene Nanocomposite for Alkaline Hydrogen Evolution Reaction

Munawar Khalil<sup>a,b\*</sup>, Michael Lesa<sup>a,b</sup>, Alexander G. Juandito<sup>b,c</sup>, Afiten R. Sanjaya<sup>a</sup>, Tribidasari A. Ivandini<sup>a</sup>, Grandprix T.M. Kadja<sup>d,e,f</sup>, Muhammad Haris Mahyuddin<sup>e,g</sup>, Mehran Sookhakistan<sup>h,i</sup>, Yatimah Alias<sup>h,i</sup>

<sup>a</sup>Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, 16424 Depok, West Java, Indonesia.

<sup>b</sup>Low Dimension Materials Lab, Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, 16424 Depok, West Java, Indonesia.

<sup>c</sup>Department of Physics, Faculty of Mathematics and Natural Sciences, Universitas Indonesia, 16424 Depok, West Java, Indonesia.

<sup>d</sup>Division of Inorganic and Physical Chemistry, Institut Teknologi Bandung, Jalan Ganesha No. 10, Bandung, 40132, Indonesia

<sup>e</sup>Research Center for Nanosciences and Nanotechnology, Institut Teknologi Bandung, Jalan Ganesha No. 10, Bandung, 40132, Indonesia

<sup>f</sup>Center for Catalysis and Reaction Engineering, Institut Teknologi Bandung, Jalan Ganesha No. 10, Bandung, 40132, Indonesia

<sup>g</sup>Research Group of Advanced Functional Materials, Faculty of Industrial Technology, Institut Teknologi Bandung, Jalan Ganesha No. 10, Bandung 40132, Indonesia

<sup>h</sup>Department of Chemistry, Faculty of Science, University of Malaya, Kuala Lumpur, 50603, Malaysia.

<sup>i</sup>Centre for Ionic Liquid, Department of Chemistry, Faculty of Science, University of Malaya, Kuala Lumpur, 50603, Malaysia.

\*Corresponding author: mkhalil@sci.ui.ac.id

### Supplementary Information

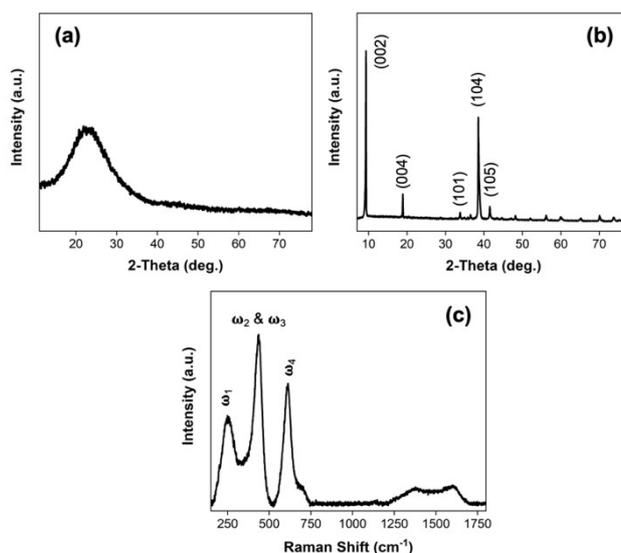


Figure S1. XRD pattern of (a) SBA-15 and (b) Ti<sub>3</sub>AlC<sub>2</sub>, (c) Raman spectrum of Ti<sub>3</sub>AlC<sub>2</sub>.

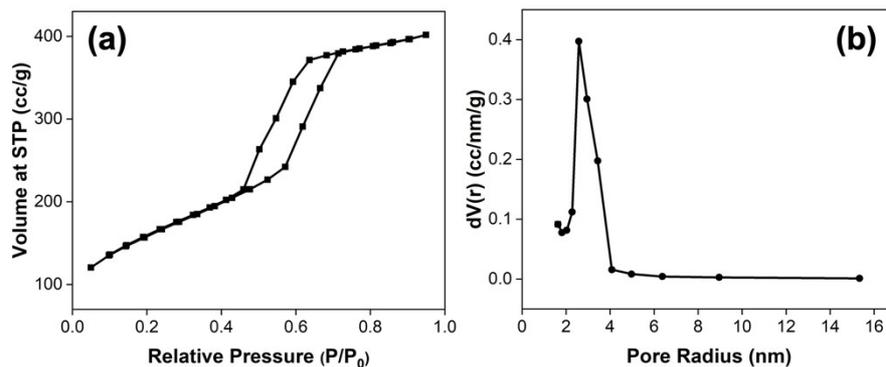


Figure S2. (a) N<sub>2</sub> adsorption-desorption isotherm, and (b) pore size distribution plot of the as-prepared SBA-15.

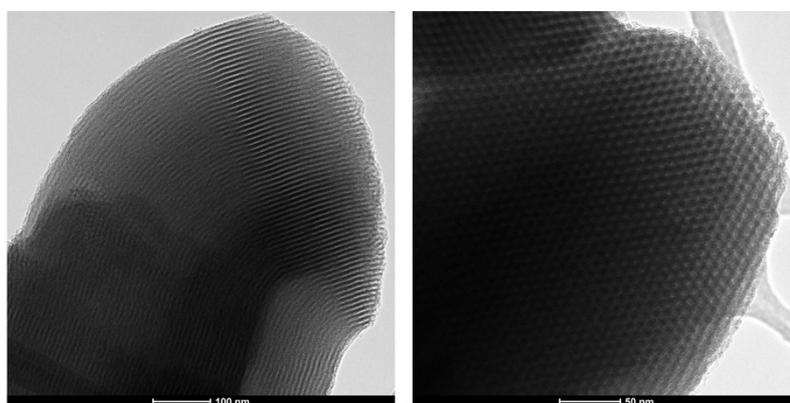


Figure S3. TEM images of SBA-15.

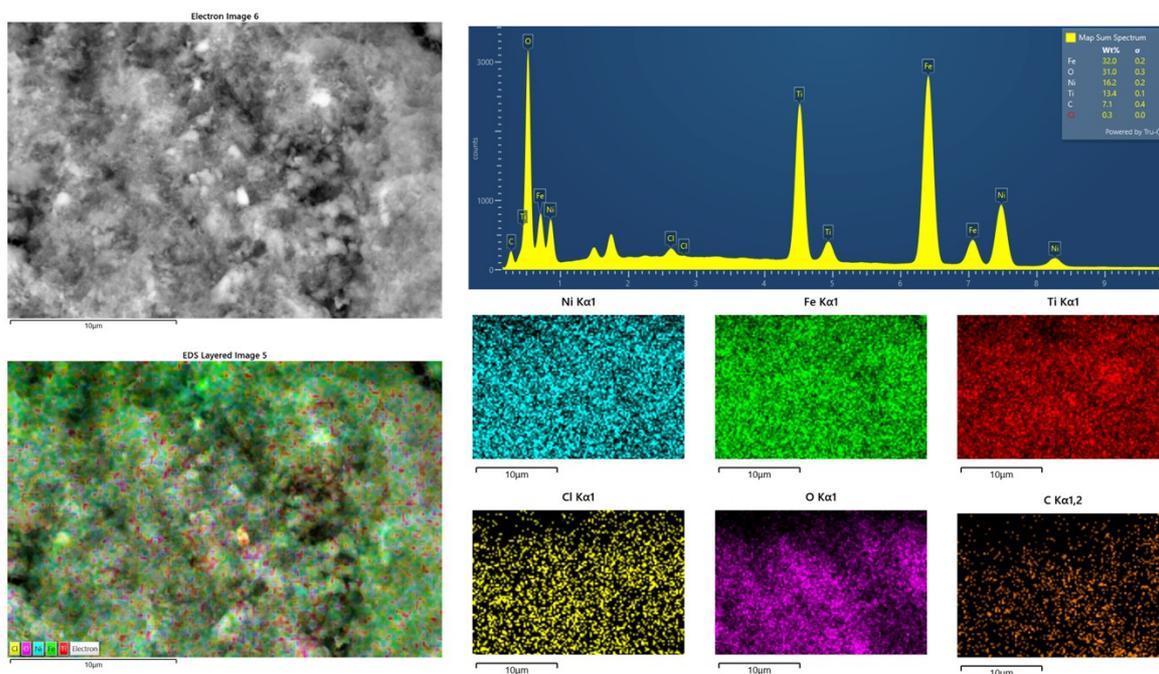


Figure S4. SEM-EDX mapping of m-NiFe<sub>2</sub>O<sub>4</sub>/Mxene composite.

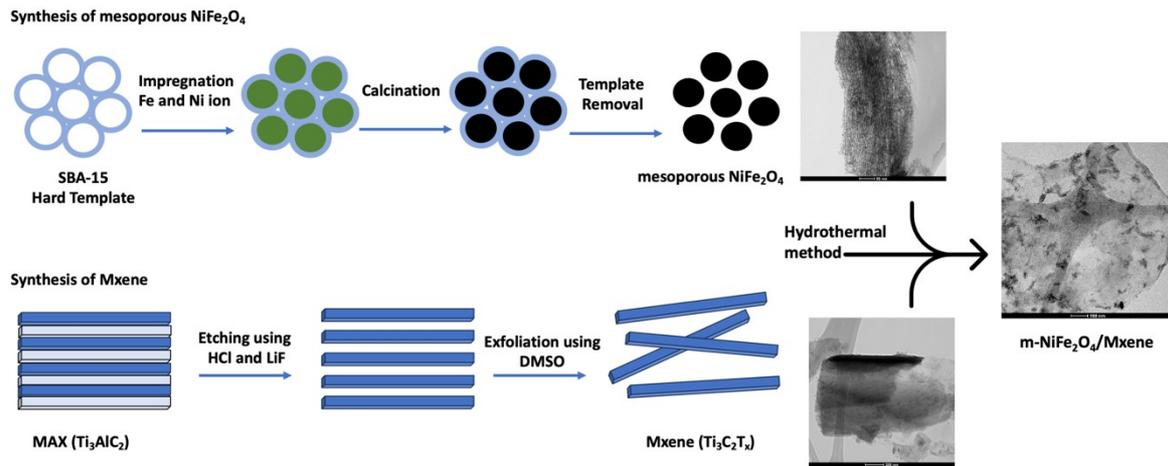


Figure S5. Schematic illustration for the synthesis of m-NiFe<sub>2</sub>O<sub>4</sub>/Mxene composite.