

## Electronic Supplementary Information

### Catalytic behaviors of Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> and Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> catalysts during the hydrodeoxygenation of palm oil

Atthapon Srifa <sup>a,b</sup>, Nawin Viriya-empikul <sup>a</sup>,

Suttichai Assabumrungrat <sup>b</sup>, Kajornsak Faungnawakij <sup>a,\*</sup>,

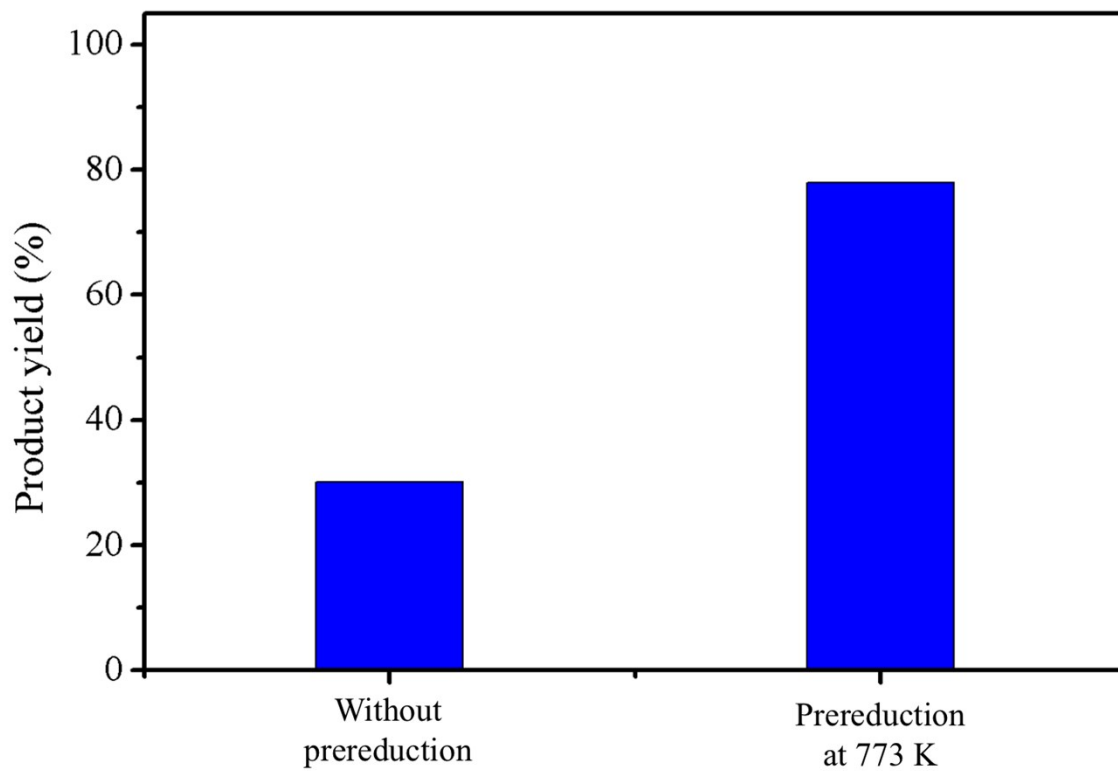
<sup>a</sup> Nanomaterials for Energy and Catalysis Laboratory, National Nanotechnology Center (NANOTEC), National Science and Technology Development Agency (NSTDA), 111 Thailand Science Park, Thanon Phahonyothin, Tambon Khlong Nueng, Amphoe Khlong Luang, Pathum Thani 12120, Thailand

<sup>b</sup> Center of Excellence in Catalysis and Catalytic Reaction Engineering, Department of Chemical Engineering, Faculty of Engineering, Chulalongkorn University, Bangkok 10330, Thailand

\* To whom correspondence should be addressed.

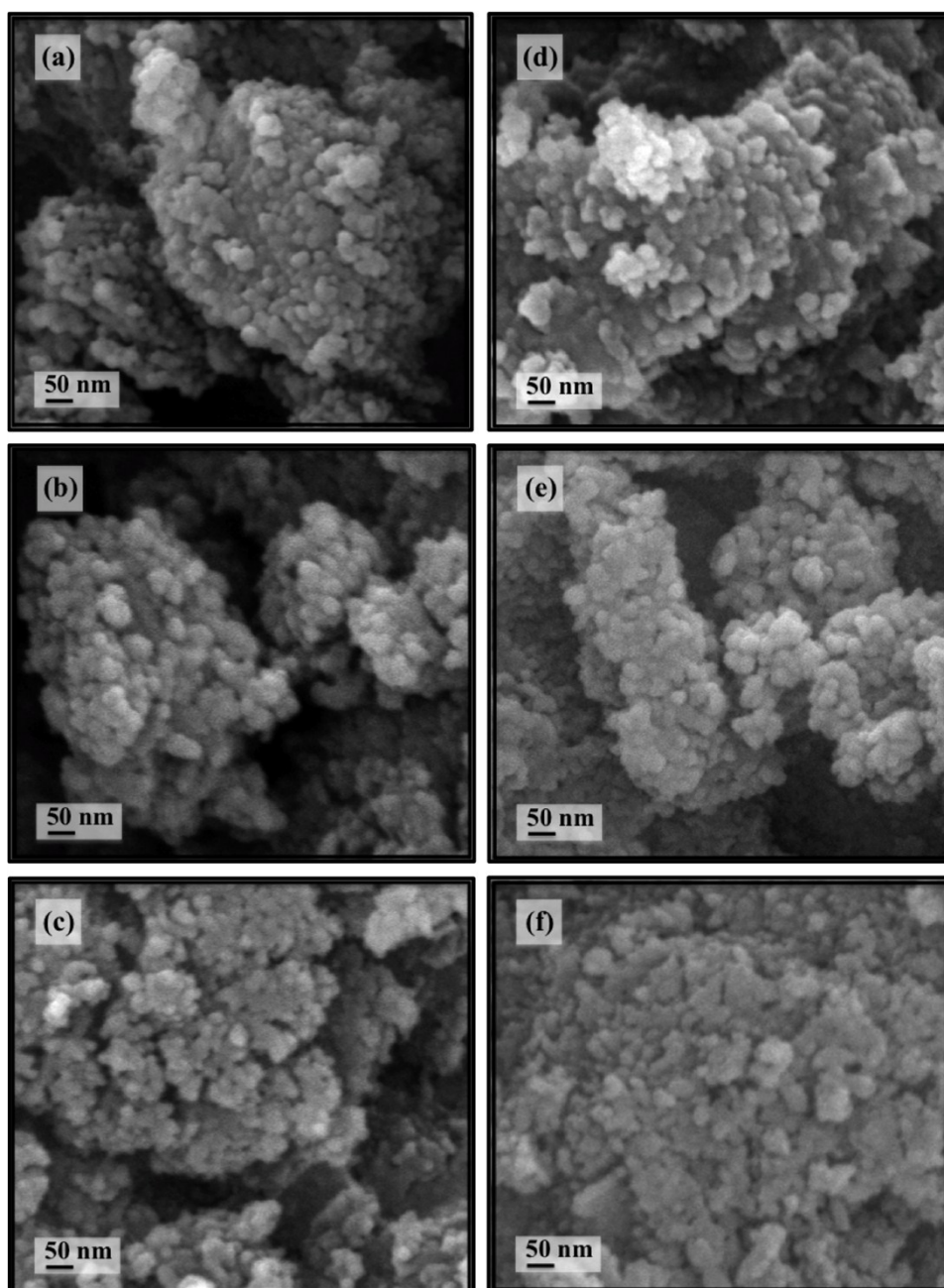
Tel.: +66-2-564-7100 ext. 6638; Fax: +66-2-564-6981

Email address: kajornsak@nanotec.or.th (K. Faungnawakij)

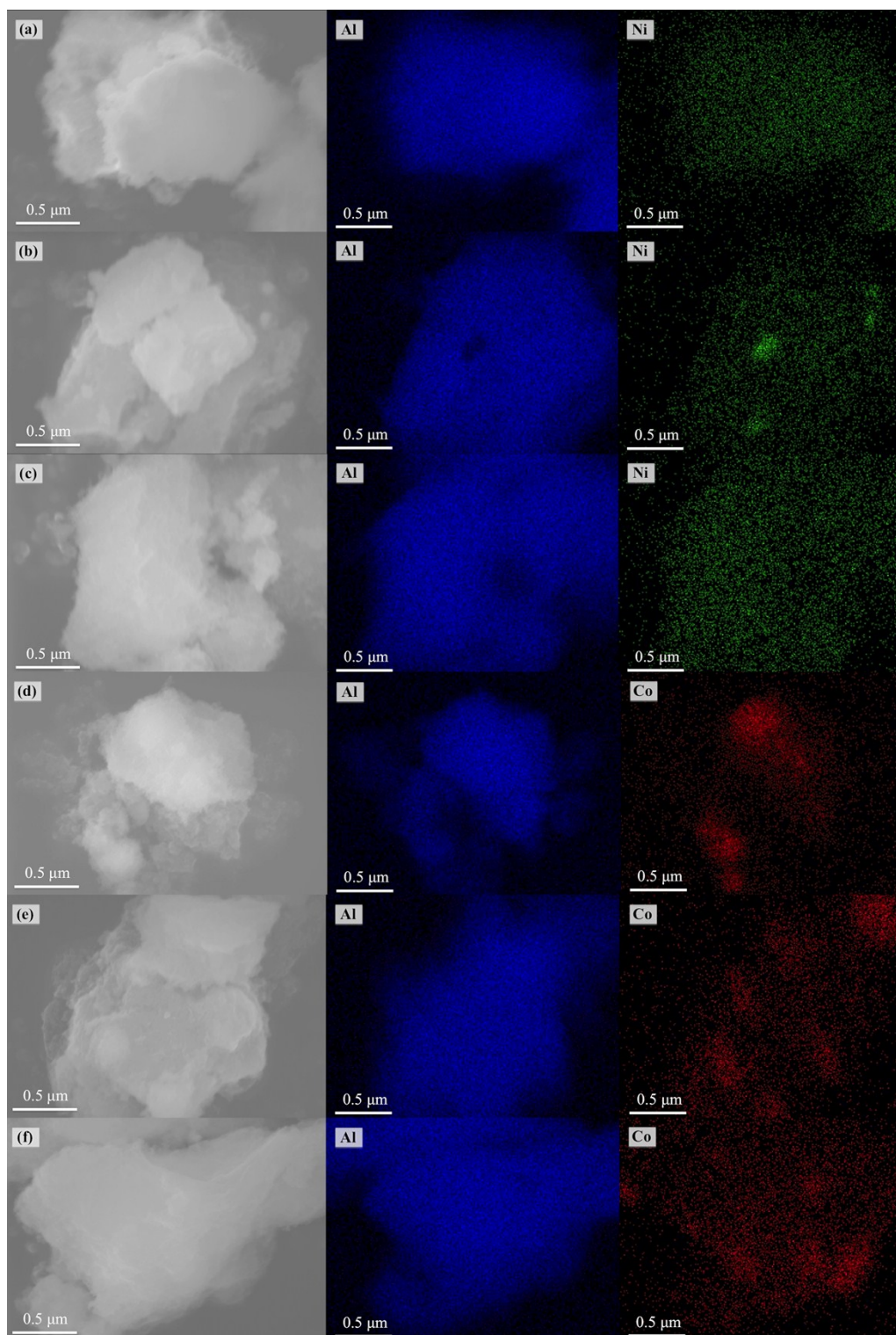


**Fig. S1** Effect of catalyst prereduction on the product yield over Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> catalyst.

Reaction conditions: 573 K, 5 MPa, LHSV of 2 h<sup>-1</sup>, and H<sub>2</sub>/oil ratio of 1,000 N(cm<sup>3</sup>/cm<sup>3</sup>)



**Fig. S2** FE-SEM images of the pre-reduced (a), spent (b), and regenerated (c) Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> and the pre-reduced (d), spent (e), and regenerated (f) Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>.



**Fig. S3** SEM images and EDX elemental distributions (Al, Ni, and Co) of the pre-reduced (a), spent (b), and regenerated (c) Ni/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub> and the pre-reduced (d), spent (e), and regenerated (f) Co/ $\gamma$ -Al<sub>2</sub>O<sub>3</sub>.