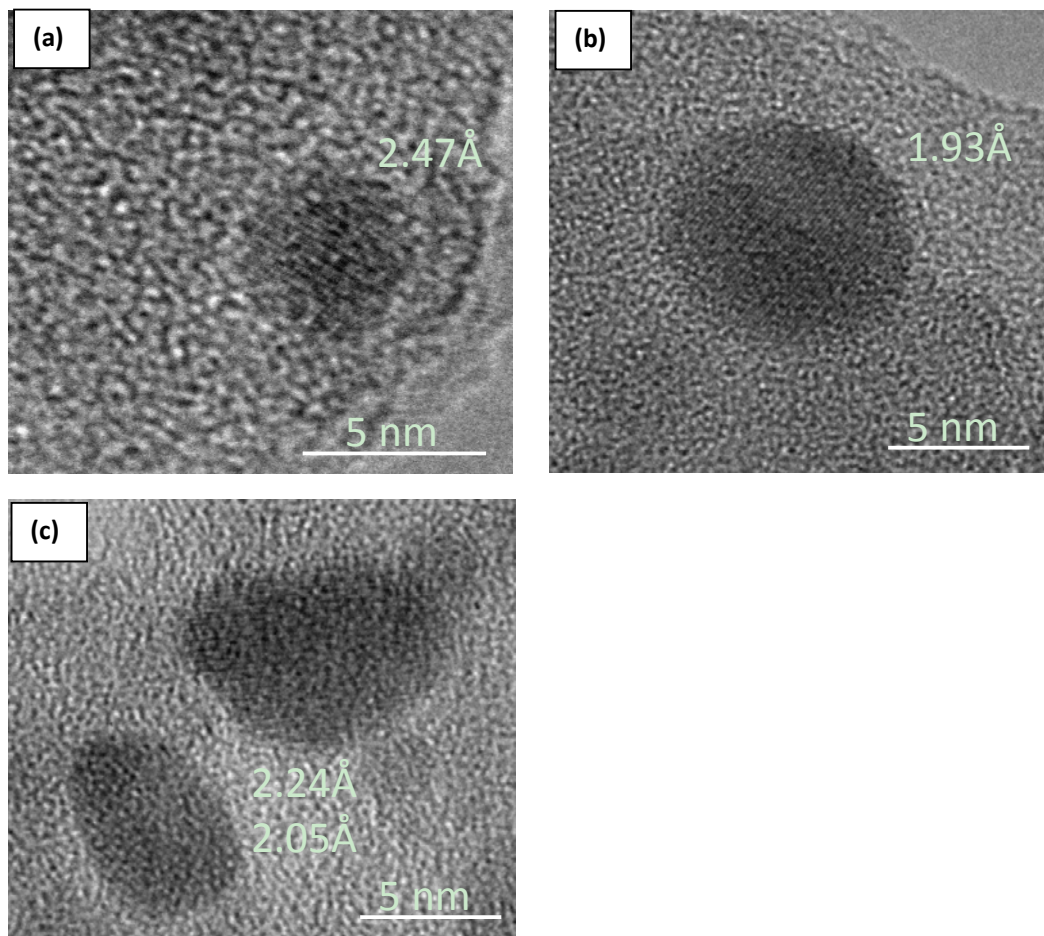
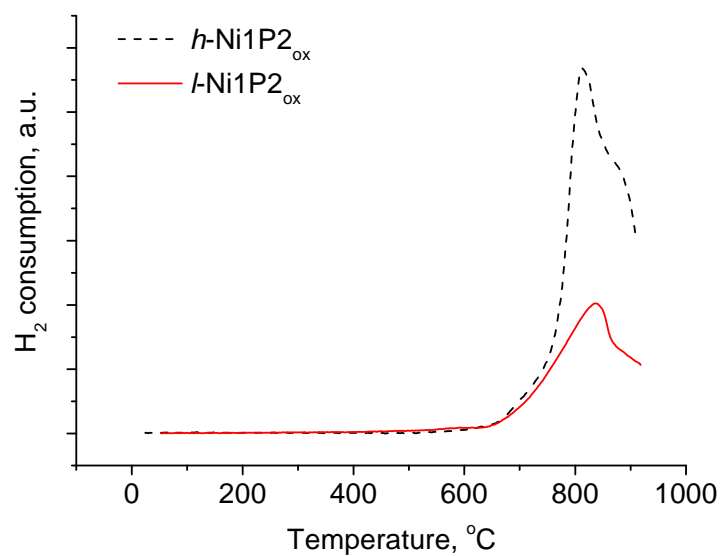


## Supplementary Materials: HDO of methyl palmitate over silica-supported Ni phosphides: insight into Ni/P effect

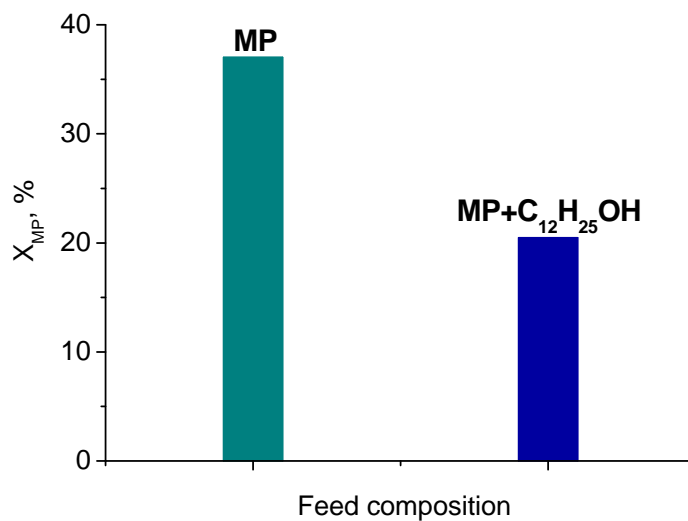
Irina V. Deliy\*, Ivan V. Shamanaev, Evgeny Yu. Gerasimov, Vera P. Pakharukova, Ilya V. Yakovlev, Olga B. Lapina, Pavel V. Aleksandrov and Galina A. Bukhtiyarova



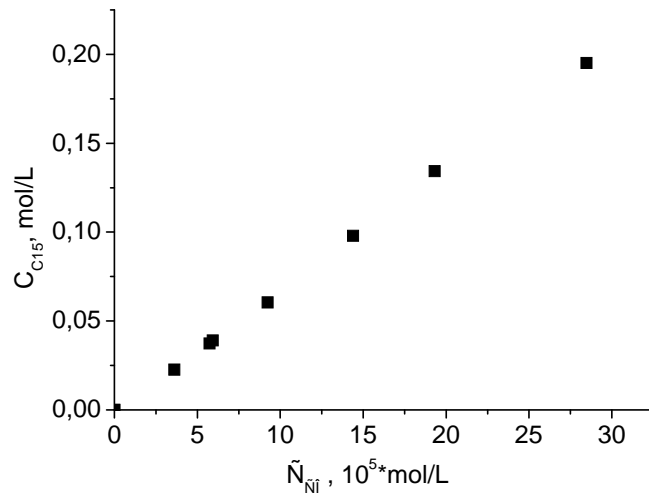
**Figure S1.** TEM images of Ni<sub>x</sub>P<sub>y</sub>/SiO<sub>2</sub> catalysts with different initial molar Ni/P ratio: (a) *l*-Ni<sub>2</sub>P<sub>1</sub>; (b) *l*-Ni<sub>1</sub>P<sub>1</sub>; (c) *l*-Ni<sub>1</sub>P<sub>2</sub>.



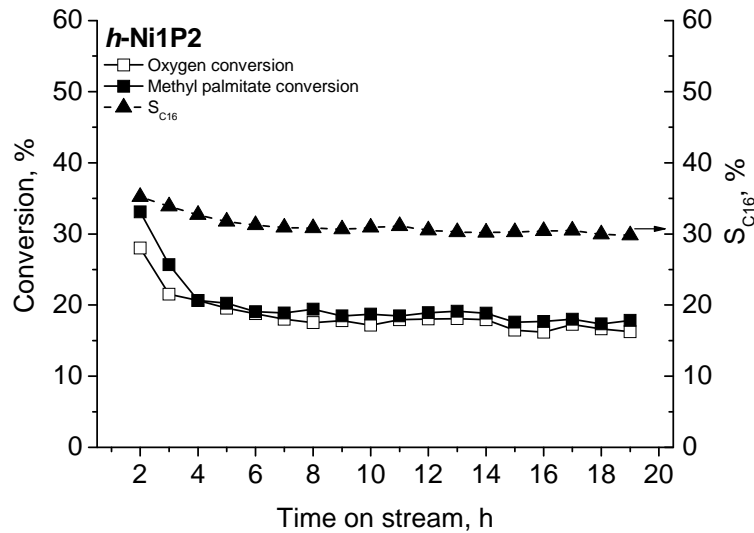
**Figure S2.** H<sub>2</sub>-TPR profiles of Ni<sub>x</sub>P<sub>y</sub>/SiO<sub>2</sub> catalyst oxide precursors with different nickel phosphide loading: *h*-Ni1P2 and *l*-Ni1P2.



**Figure S3.** Effect of the dodecanol additive on methyl palmitate conversion during HDO over *l*-Ni1P2 catalyst. Feed composition: mixture 1 – 10.0 wt% MP in *n*-octane; mixture 2 – 10.0 wt% MP and 5 wt% C<sub>12</sub>H<sub>25</sub>OH in *n*-octane. Reaction conditions: P<sub>H<sub>2</sub></sub> = 3.0 MPa, T = 290°C, H<sub>2</sub>/feed = 600 Nm<sup>3</sup>/Nm<sup>3</sup>, LHSV<sub>of MP</sub> = 1.02 h<sup>-1</sup>.



**Figure S4.** *n*-Pentadecane concentration in liquid phase versus CO concentration in exhaust gas phase during palmitic acid HDO over *l*-Ni1P2 catalyst. Reaction conditions: feed composition 5.0 wt% palmitic acid in *n*-dodecane,  $P_{H_2} = 3.0 \text{ MPa}$ ,  $T = 290^\circ\text{C}$ ,  $H_2/\text{feed} = 600 \text{ Nm}^3/\text{Nm}^3$ ,  $LHSV = 0.3\text{--}6.4 \text{ h}^{-1}$ .



**Figure S5.** Methyl palmitate and oxygen-containing compounds conversions and  $C_{16}$  hydrocarbons selectivity ( $S_{C16}$ ) during methyl palmitate HDO over *h*-Ni1P2 catalysts. Reaction conditions:  $P_{H_2} = 3.0 \text{ MPa}$ ,  $T = 290^\circ\text{C}$ ,  $H_2/\text{feed} = 600 \text{ Nm}^3/\text{Nm}^3$ ,  $LHSV = 10.7 \text{ h}^{-1}$ .