

## SUPPORTING INFORMATION FOR

### Hydrodeoxygenation of bio-oil model compounds over Ni- and Pt-catalysts supported on hydrophobized halloysite nanotubes

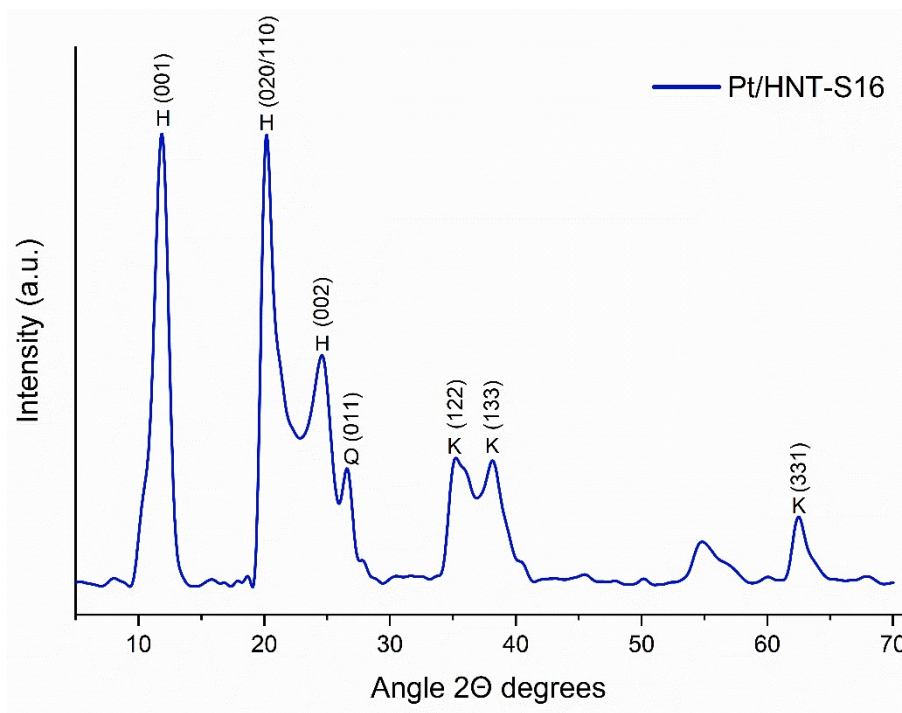
Gleb Zasyalov<sup>1</sup>, Vladimir Klimovsky<sup>1</sup>, Egor Abramov<sup>1</sup>, Anna Vutolkina<sup>1,2</sup>,  
Ekaterina Mustakimova<sup>2</sup>, Sergey Verevkin<sup>3</sup>, Valentin Stytsenko<sup>1</sup>, Aleksandr Glotov<sup>1\*</sup>

<sup>1</sup>Gubkin Russian State University of Oil and Gas, 119991, Russia, Moscow, 65 Leninsky Prospekt;

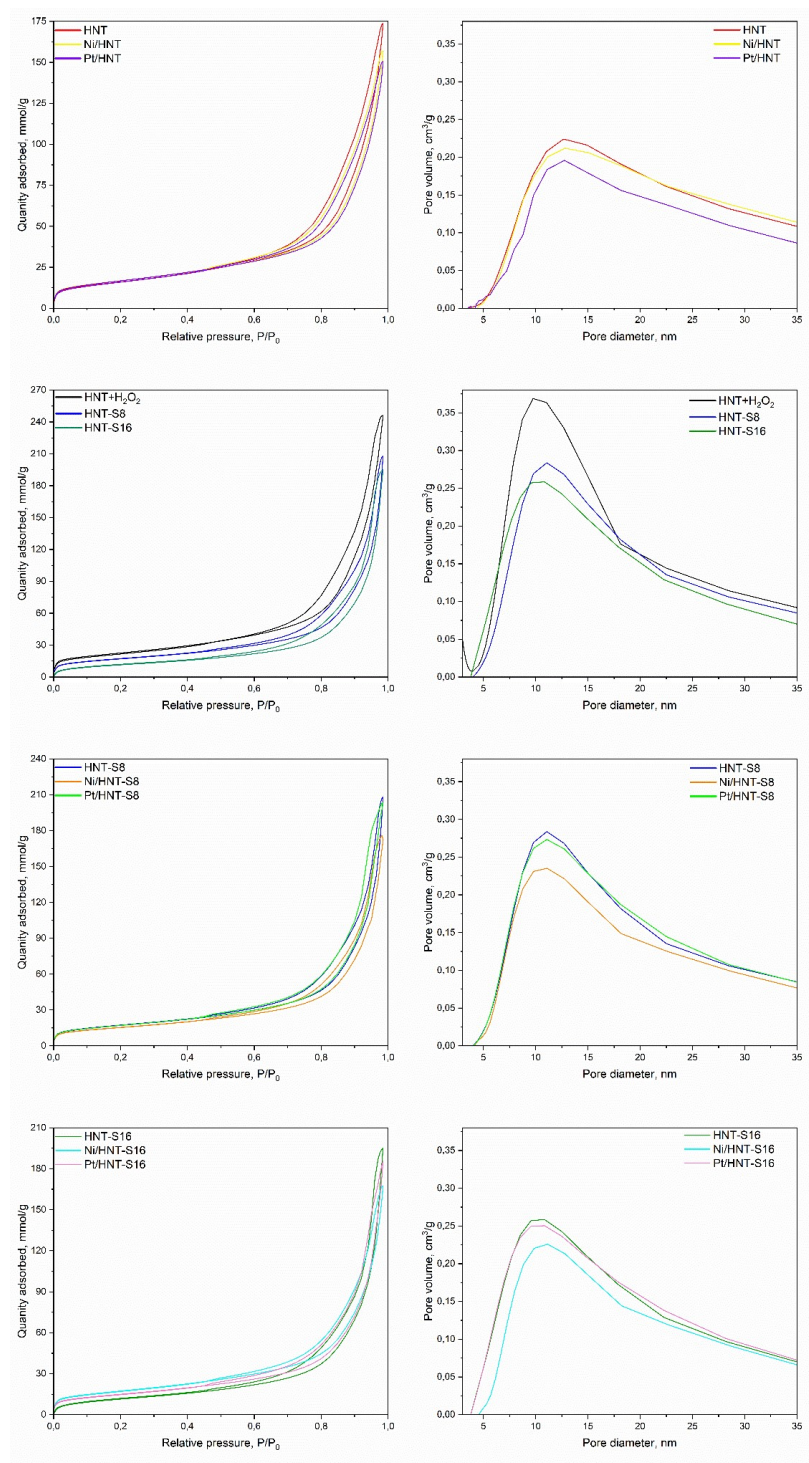
<sup>2</sup>Lomonosov Moscow State University, 119991, GSP-1, Russia, Moscow, 1-3 Leninskiye Gory;

<sup>3</sup>Competence Centre CALOR of Faculty of Interdisciplinary Research at University of Rostock, 18059, Germany, Rostock, Universitätsplatz 1.

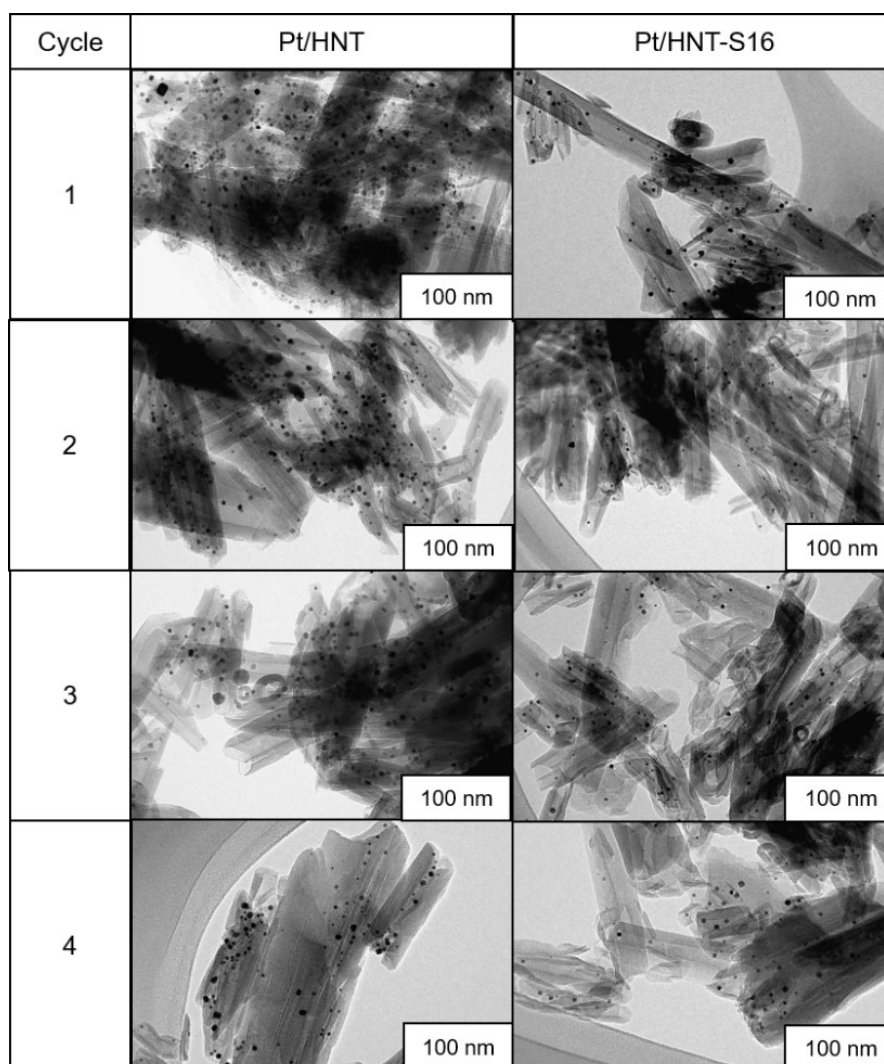
\*corresponding author: Aleksandr Glotov, glotov.a@gubkin.ru



**Fig. S1.** XRD patterns of the Pt/HNT-S16 sample



**Fig. S2.** Adsorption–desorption isotherms and pore size distribution for supports and catalysts



**Fig. S3.** TEM images for Pt/HNT and Pt/HNT-S16 catalysts under the recirculation mode of the HDO anisole-water mixture

**Table S1.** The composition of Ni and Pt catalysts and the quantitative XPS analysis of the Al 2p+Pt 4f<sub>7/2</sub>, Pt 4d<sub>5/2</sub> and Ni 2p<sub>3/2</sub> core levels

Sample	Ni/HNT	Ni/HNT-S <sub>16</sub>	Pt/HNT	Pt/HNT-S <sub>16</sub>
Surface concentration (at. %)				
C	5.3	7.1	4.2	6.1
O	55.1	54.3	55.4	53.7
Al	16.1	15.8	17.8	18.4
Si	23.2	22.5	22.6	21.6
Ni	0.3	0.4	n.a.	n.a.
Pt	n.a.	n.a.	0.1	0.1
Component ratios				
Si/Al	1.4	1.4	1.3	1.2
Ni(Pt)/Al	0.02	0.03	0.006	0.005
Ni(Pt)/Si	0.01	0.02	0.004	0.005
Ni(Pt)/(Si+Al)	0.01	0.01	0.002	0.003

Characteristics of active phase species				
Sample	Ni/HNT		Ni/HNT-S <sub>16</sub>	
Si 2 <i>p</i>	Binding Energy, eV	Content, rel. %	Binding Energy, eV	Content, rel. %
SiO <sub>2</sub>	103.1	79.6	103.1	76.4
Ni/Si	101.4	20.4	101.5	23.6
Ni 2 <i>p</i> <sub>3/2</sub>	Binding Energy, eV	Content, rel. %	Binding Energy, eV	Content, rel. %
Ni <sup>0</sup>	851.8	3.1	849.9	1.0
NiO	853.0	19.7	850.6	7.8
Ni(OH) <sub>2</sub>	855.9	42.6	854.3	60.8
Ni <sup>2+</sup>	857.5	34.6	856.7	30.4
Sample	Pt/HNT		Pt/HNT-S <sub>16</sub>	
Si 2 <i>p</i>	Binding Energy, eV	Content, rel. %	Binding Energy, eV	Content, rel. %
SiO <sub>2</sub>	103.1	73.7	103.4	69.3
Pt/Si	101.7	26.3	102.0	30.7
Pt 4 <i>f</i> <sub>7/2</sub>	Binding Energy, eV	Content, rel. %	Binding Energy, eV	Content, rel. %
Pt <sup>0</sup>	71.8	64.6	70.6	68.7
Pt/Si	73.1	35.4	72.0	31.3
Pt 4 <i>d</i> <sub>5/2</sub>	Binding Energy, eV	Content, rel. %	Binding Energy, eV	Content, rel. %
Pt <sup>0</sup>	315.7	54.4	315.0	68.5
Pt/Si	318.7	38.1	318.2	24.5
Pt <sup>4+</sup>	322.6	7.5	322.2	7.0