SUPPLEMENTARY MATERIAL TO

**Oxidative ammonolysis of 3,4-dimethylpyridine** **on the vanadium oxide catalysts**

PAVEL VOROBYEV, ANNA SEREBRYANSKAYA,

OLGA YUGAY\* and TATYANA MIKHAILOVSKAYA

*A.B. Bekturov Institute of Chemical Sciences JSC, Almaty 050010, Kazakhstan*

*J. Serb. Chem. Soc.*

CHARACTERIZATION DATA

***3-Methyl-4-cyanopyridine***

Anal. Calcd. for C7H6N2: C, 71.17; H, 5.12; N, 23.71 %. Found: C, 71.40; H, 5.70; N, 23.87 %. IR (KBr, cm-1): 2232(C≡N). 1H-NMR (399.78 MHz, DMSО-d6, δ/ppm): 2.37 (3H,s, СН3); 7.65 (1H, d, 3J=5.2 Hz, C-3H); 8.53(1H, d, 3J=5.2 Hz, C-4H); 8.63(1H, s, C-6H). 13C-NMR (100.53 MHz, DMSО-d6, δ, ppm): 116.29 (С-2); 120.06 (С≡N); 125.61 (С-3), 135.57 (С-1), 148.16 (С-4); 151.70 (С-6).

***Imide pyridine-3,4-dicarboxylic acid***

Anal. Calcd. for C7H4N2O2: C, 56.76; H, 2.72; N, 18.91 %. Found: C, 56.75; H, 2.20; N, 18.40 %. IR (KBr, cm-1): 3015 (N-H); 1777.7 and 1727,7(C=O). 1H–NMR (399.78 MHz, DMSО-d6, δ, ppm): 7.75 (1H, d, 3J=4.8Hz, C-8H); 8.97 (1H, s, C-2H); 9.00 (1H, d, 3J=4.8Hz, C-9H); 11.61(1H, s, NH). 13C-NMR (100.53 MHz, DMSО-d6, δ, ppm): 117.30 (С-8); 127.24 (С-3); 140.70 (С-7), 144.47 (С-2), 156.06 (С-9); 168.66 (С-4=O); 169.11(С-6=O).

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\Fig. S-1. 1H-NMR spectrum of mono.tif

Fig. S-1. 1H-NMR spectrum of 3-Methyl-4-cyanopyridine (399.78 MHz, DMSО-d6).

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\S-Fig.2. 13C-NMR of mono копи.tif

Fig. S-2. 13C-NMR spectrum of 3-Methyl-4-cyanopyridine (100.53 MHz, DMSО-d6).

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\S-Fig.3. HMQC of mono.tif

Fig. S-3. HMQC spectrum of 3-Methyl-4-cyanopyridine.

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\Fig. S-4. COSY spectrum of 3-Methyl-4-cyanopyridine.tif

Fig. S-4. COSY spectrum of 3-Methyl-4-cyanopyridine.

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\S-5. 1H-NMR of imide.tif

Fig. S-5. 1H-NMR spectrum of imide pyridine-3,4-dicarboxylic acid (399.78 MHz, DMSО-d6).

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\S-6.13C-NMR of imide.tif

Fig. S-6. 13C-NMR spectrum of imide pyridine-3,4-dicarboxylic acid (100.53 MHz, DMSО-d6).

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\S-7. HMQC of imide.tif

Fig. S-7. HMQC spectrum of imide pyridine-3,4-dicarboxylic acid.

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\S-8. COSY of imide.tif

Fig. S-8. COSY spectrum of imide pyridine-3,4-dicarboxylic acid.

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\IR-1 screen.tif

Fig. S-9. IR spectrum of 3-Methyl-4-cyanopyridine.

C:\Users\Yugay\Documents\Лутидины-2018\EDITING\Submitting 2\Submitting 2-16.01.19\Figures\S-Fig-revised\IR-2-screen.tif

Fig. S-10. IR spectrum of imide pyridine-3,4-dicarboxylic acid.