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

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CHARACTERIZATION DATA

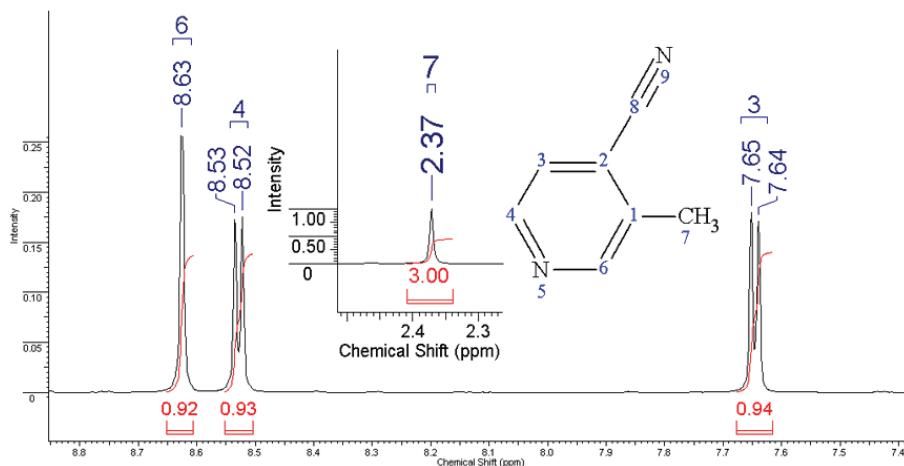
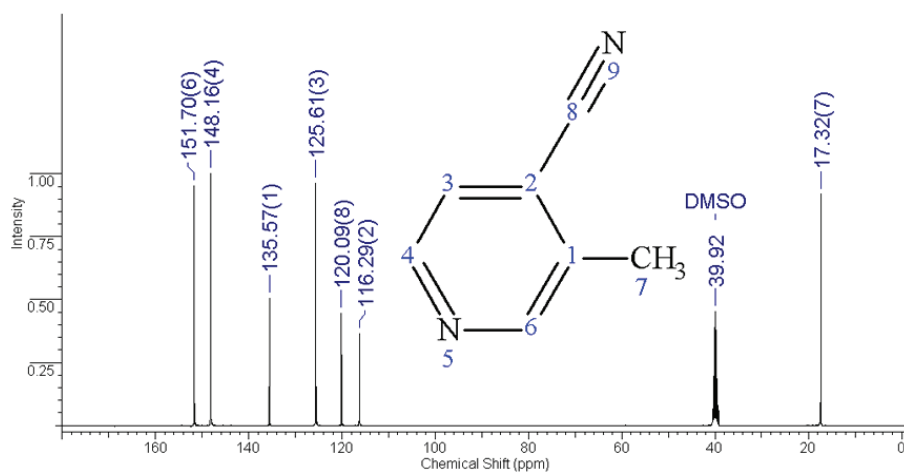
3-Methyl-4-cyanopyridine

Anal. Calcd. for $C_7H_6N_2$: 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, DMSO- d_6 , δ / ppm): 2.37 (3H, *s*, CH₃); 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). ^{13}C -NMR (100.53 MHz, DMSO- d_6 , δ / ppm): 116.29 (C-2); 120.06 (C≡N); 125.61 (C-3), 135.57 (C-1), 148.16 (C-4); 151.70 (C-6).

Imide pyridine-3,4-dicarboxylic acid

Anal. Calcd. for $C_7H_4N_2O_2$: 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, DMSO- d_6 , δ / ppm): 7.75 (1H, *d*, $^3J = 4.8$ Hz, C-8H); 8.97 (1H, *s*, C-2H); 9.00 (1H, *d*, $^3J = 4.8$ Hz, C-9H); 11.61 (1H, *s*, NH). ^{13}C -NMR (100.53 MHz, DMSO- d_6 , δ / ppm): 117.30 (C-8); 127.24 (C-3); 140.70 (C-7), 144.47 (C-2), 156.06 (C-9); 168.66 (C-4=O); 169.11(C-6=O).

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Fig. S-1. $^1\text{H-NMR}$ spectrum of 3-methyl-4-cyanopyridine (399.78 MHz, $\text{DMSO-}d_6$).Fig. S-2. $^{13}\text{C-NMR}$ spectrum of 3-methyl-4-cyanopyridine (100.53 MHz, $\text{DMSO-}d_6$).

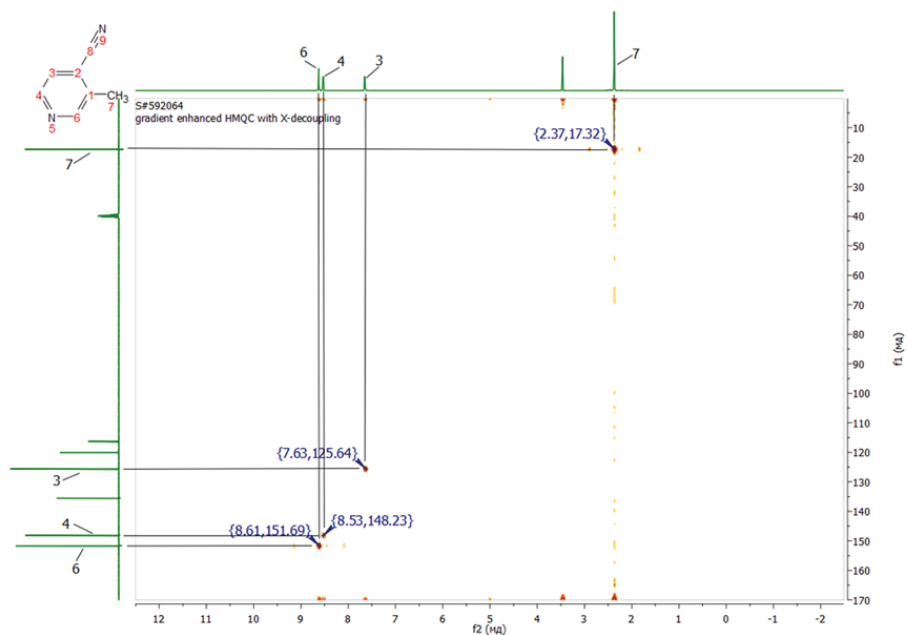


Fig. S-3. HMQC spectrum of 3-methyl-4-cyanopyridine.

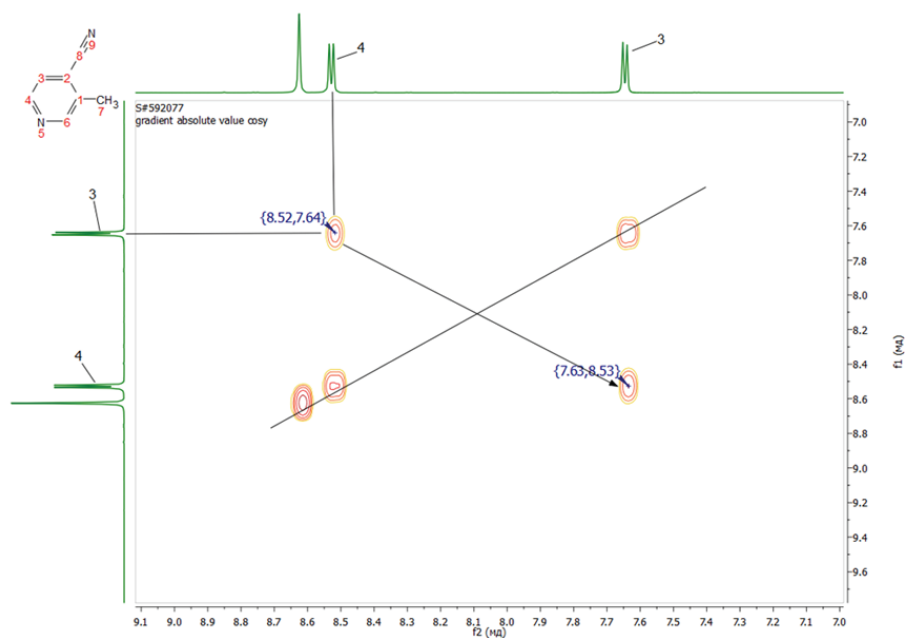


Fig. S-4. COSY spectrum of 3-methyl-4-cyanopyridine.

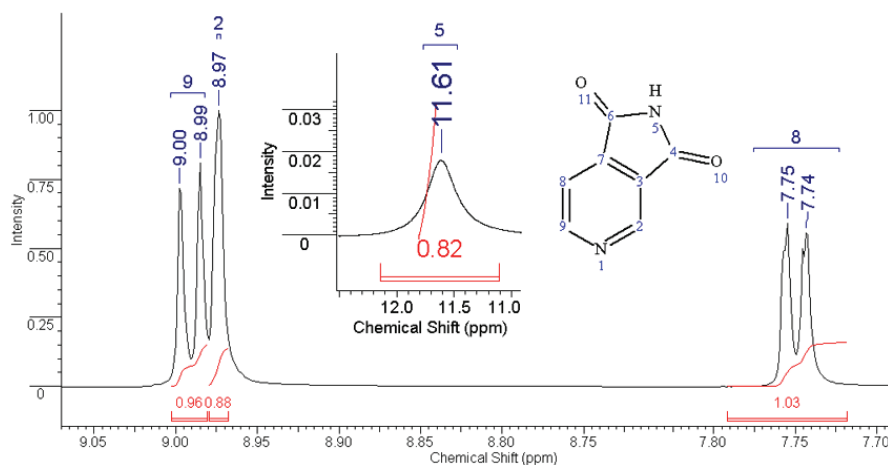


Fig. S-5. ¹H-NMR spectrum of imide pyridine-3,4-dicarboxylic acid (399.78 MHz, DMSO-*d*₆).

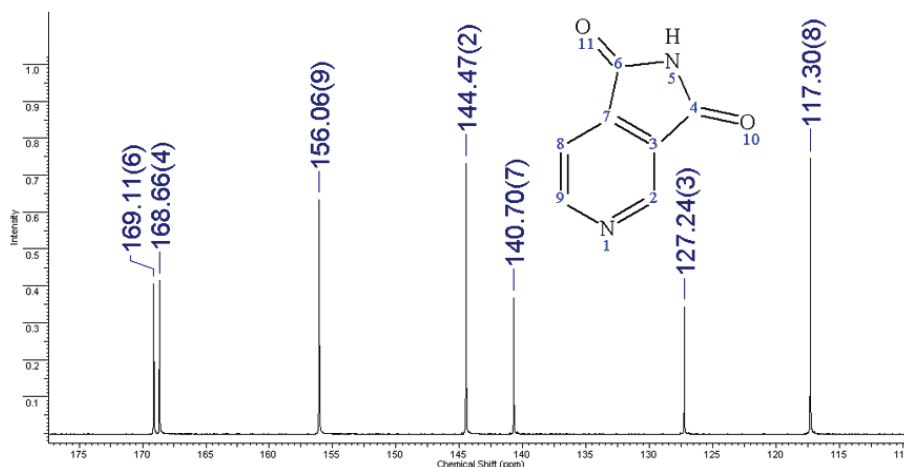


Fig. S-6. ¹³C-NMR spectrum of imide pyridine-3,4-dicarboxylic acid (100.53 MHz, DMSO-*d*₆).

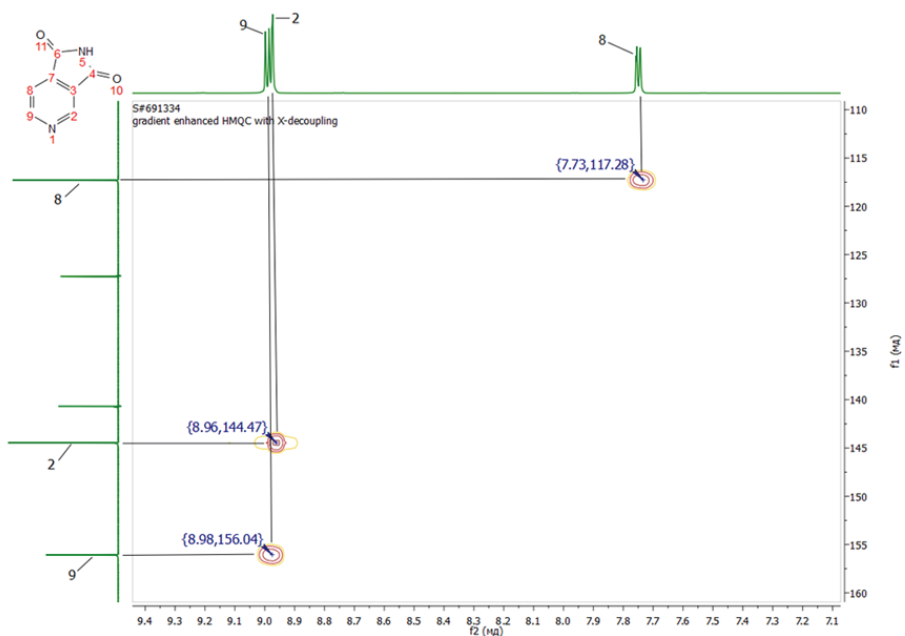


Fig. S-7. HMQC spectrum of imide pyridine-3,4-dicarboxylic acid.

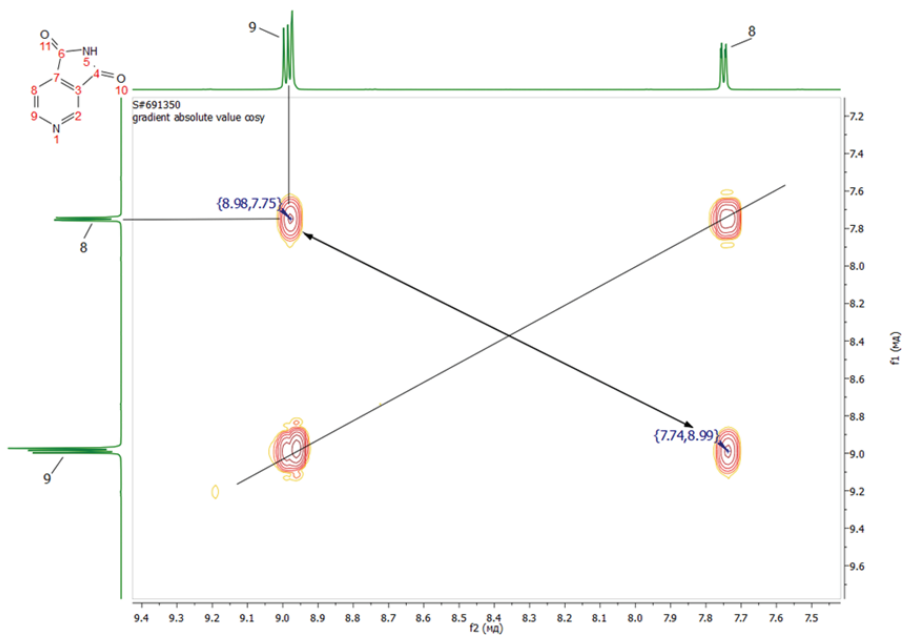


Fig. S-8. COSY spectrum of imide pyridine-3,4-dicarboxylic acid.

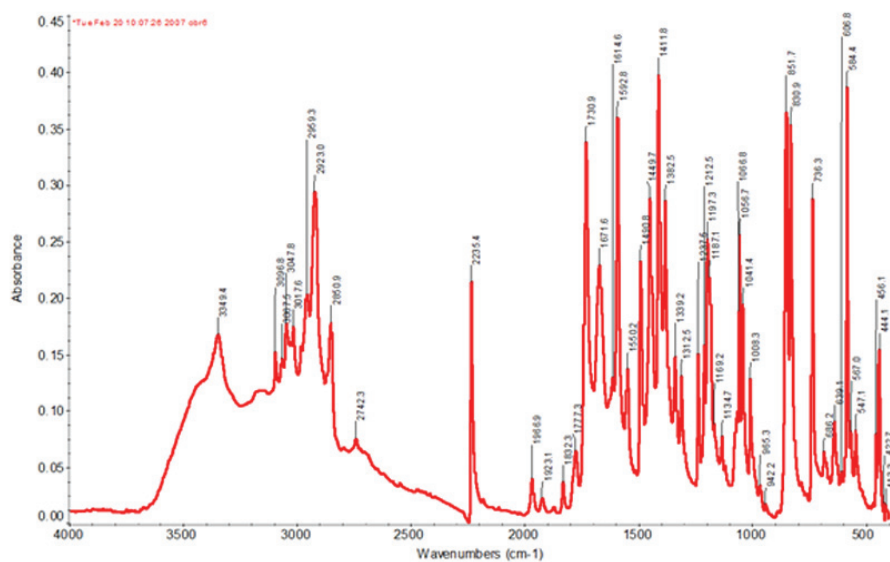


Fig. S-9. IR spectrum of 3-Methyl-4-cyanopyridine.

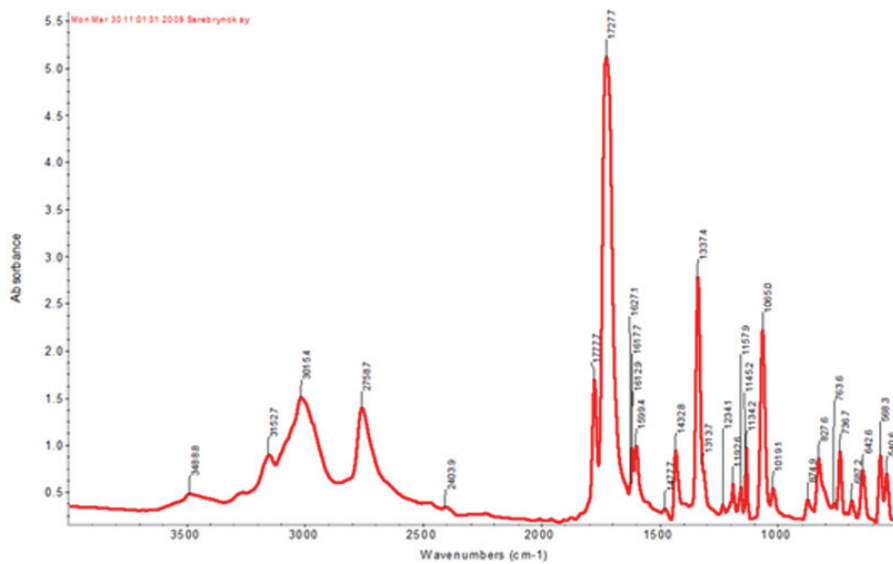


Fig. S-10. IR spectrum of imide pyridine-3,4-dicarboxylic acid.