Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary Information

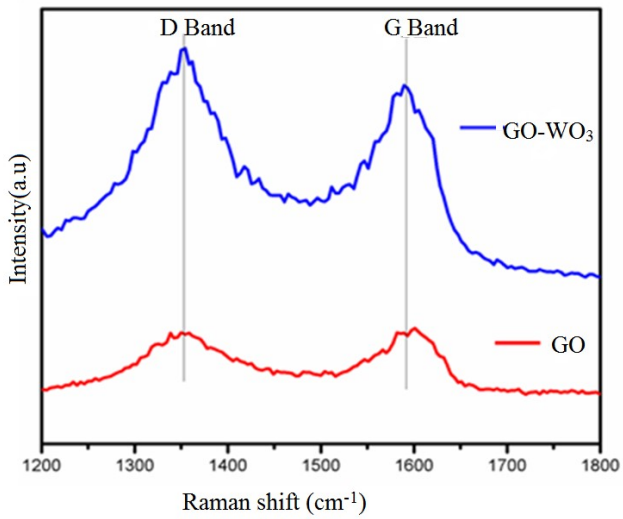


Fig.S1. FT-RAMAN spectra of GO and 20wt % loaded WO_3 with GO.

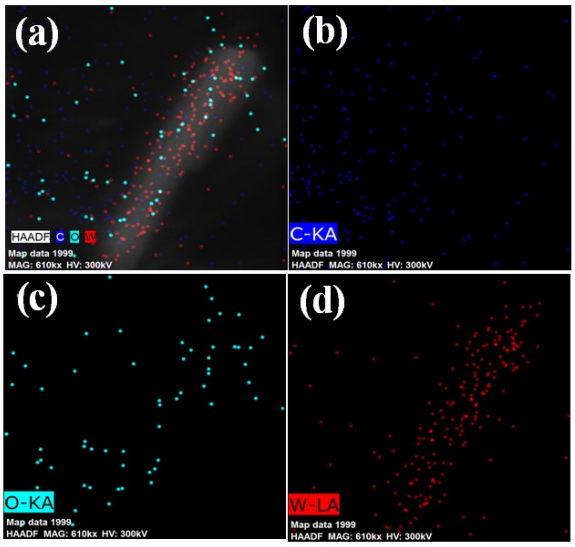


Fig.S2. Elemental mapping of prepared catalyst GO-WO_3 (a) HAADF image of C, O, W (b) C, (c) O and (d) W.

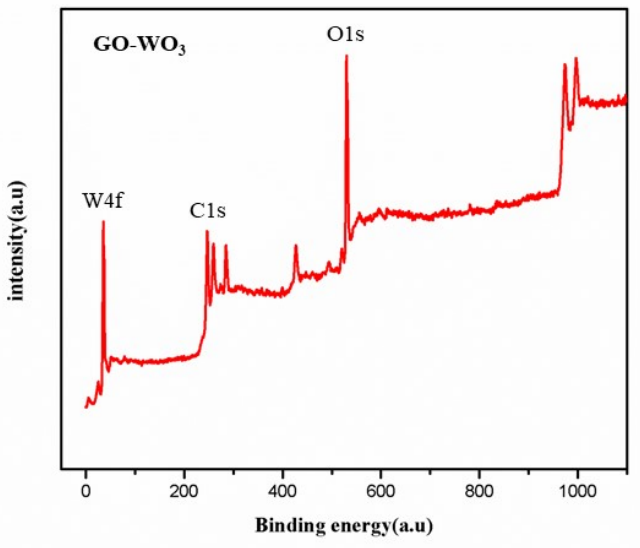


Fig.S3. Survey scan study of optimized GO-WO_3 catalyst.

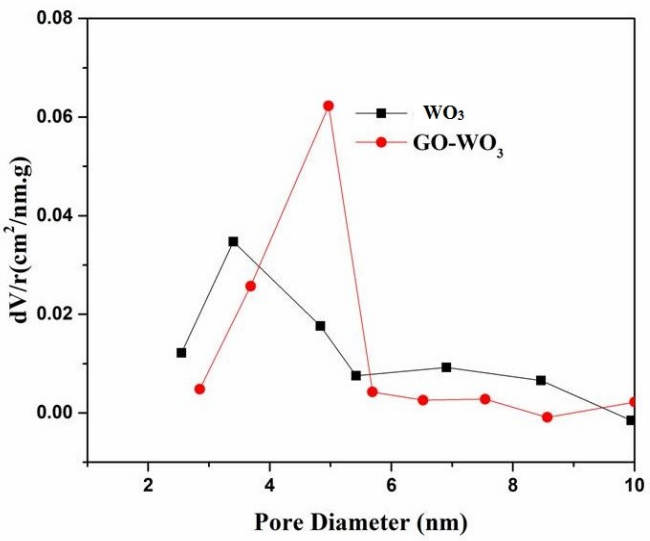


Fig.S4. shows the pore size distribution curve of WO_3 and GO-WO_3.

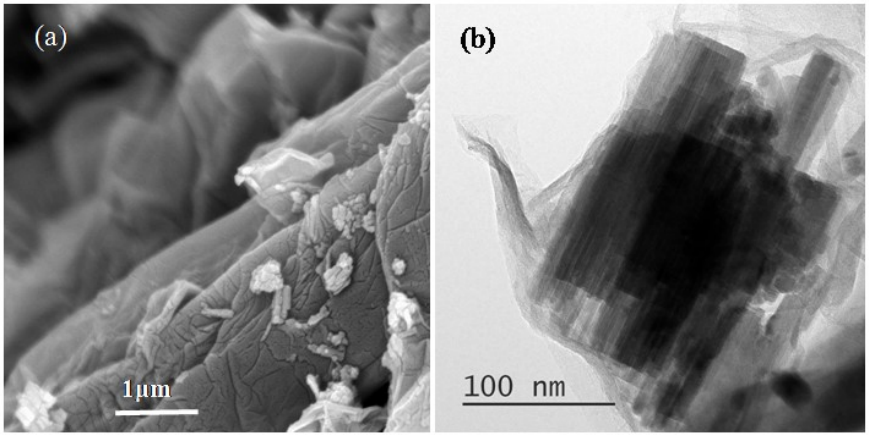
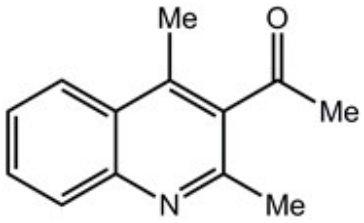
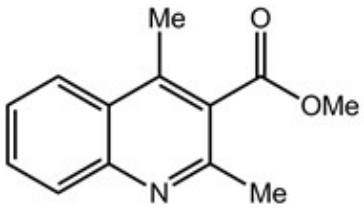


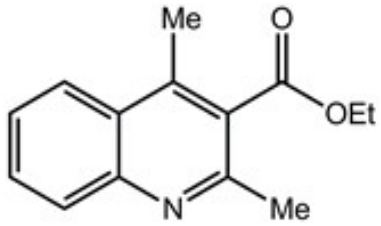
Fig.S5. FESEM image (a) and TEM image (b) of catalyst GO-WO_3 after 5th cycles



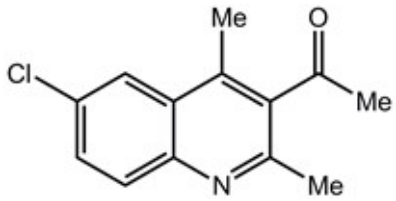
1-(2,4 dimethyl quinoline-3-yl) Ethanone was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate : hexane (2 : 98, R_f= 0.5) and Melting point(Mp) =114-115 °C, (8mg, 87% yield), ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm =1.40 (3H, t, J 7.1 Hz, CH_3), 2.57 (3H, s, CH_3), 2.68 (3H, s,CH_3), 7.46–7.51 (1H, m, CH), 7.62–7.65 (1H, m, CH),. 7.91 (1H, d, J 8.0 Hz, CH), 7.98 (1H, d, J 8.0 Hz, C-CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 14.0, 19.8, 22.4, 124.0, 125.3, 126.0, 128.1, 131.1, 144.7, 147.9, 158.6, 165.5.



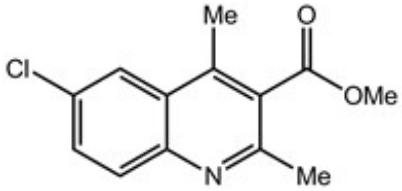
Methyl 2,4-dimethyl quinoline-3-carboxylate was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate : hexane (2 : 98, R_f= 0.45)) and Melting point(Mp) = 95 °C, (10mg, 91% yield), ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.40 (3H, t, J 7.1 Hz, CH_3), 2.57 (3H, s, CH_3), 4.42 (3H, s, OCH_3),7.46–7.51 (1H, m, CH), 7.62–7.65 (1H, m, CH),. 7.91 (1H, d, J 8.0 Hz, CH), 7.98 (1H, d, J 8.0 Hz, C-CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 14.0, 19.8, 49.4, 124.0, 125.3, 126.0, 128.1, 131.1, 144.7, 147.9, 158.6, 165.5**.**



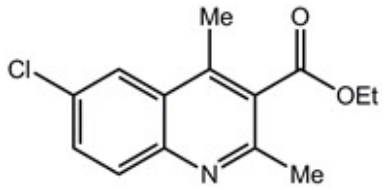
Ethyl 2,4-dimethyl quinoline-3-carboxylate was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate : hexane (3 : 97, R_f= 0.45)) and Melting point(Mp) = 97°C , (11mg, 92% yield), ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.40 (3H, t, J 7.1 Hz, CH_3), 2.57 (3H, s, CH_3), 4.42 (3H, s,OCH_2), 2.68 (3H, s, CH_3) 7.46–7.51 (1H, m, CH), 7.62–7.65 (1H, m, CH),. 7.91 (1H, d, J 8.0 Hz, CH), 7.98 (1H, d, J 8.0 Hz, C-CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 14.0, 19.8, 49.4, 66.1 124.0, 125.3, 126.0, 128.1, 131.1, 144.7, 147.9, 158.6, 165.5.



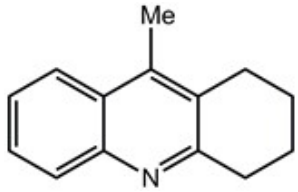
1-(6-chloro2,4-dimethyl quinoline-3-yl) ethanone was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate : hexane (3 : 97, R_f= 0.5)) Melting point(Mp) = 112-115 °C. (7mg, 88% yield), ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.40 (3H, t, J 7.1 Hz, CH_3), 2.57 (3H, s, CH_3), 2.68 (3H, s,CH_3), 7.66–7.51 (1H, m, CH), 7.82–7.65 (1H, m, CH),. 7.98 (1H, d, J 8.0 Hz, CH), 8.10 (1H, d, J 8.0 Hz, C-CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 14.0, 19.8, 22.4, 124.0, 125.3, 136.0, 138.1, 151.1, 164.7, 147.9, 158.6, 175.5**.**



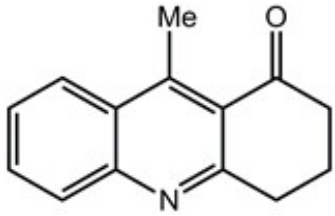
1-(6-chloro2,4-dimethyl quinoline-3-carboxylate was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate : hexane (2 : 98, R_f= 0.5)) Melting point(Mp) = 101 °C. (9mg, 91% yield),^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.40 (3H, t, J 7.1 Hz, CH3), 2.57 (3H, s, CH_3), 4.42 (3H, s, OCH3), 7.46–7.51 (1H, m, CH), 7.72–7.65 (1H, m, CH),. 7.98 (1H, d, J 8.0 Hz, CH),8.10 (1H, d, J 8.0 Hz, C-CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 14.0, 19.8, 49.4, 124.0, 125.3, 136.0, 138.1, 141.1, 164.7, 157.9, 168.6, 175.5**.**



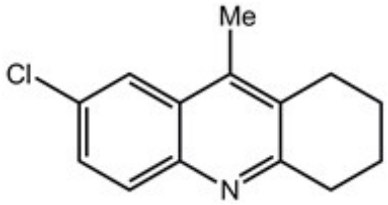
Ethyl 7-chloro-1,3 dimethyl 2-napthoate was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate : hexane (2 : 98, R_f= 0.5)) and Melting point(Mp) = 102-104 °C an oil. (8.5mg, 90% yield) ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.40 (3H, t, J 7.1 Hz, CH3), 2.57 (3H, s, CH_3), 4.42 (3H, s,OCH_2), 2.68 (3H, s, CH_3) 7.56–7.61 (1H, m, CH), 7.72–7.75 (1H, m, CH),. 7.98 (1H, d, J 8.0 Hz, CH), 8.10 (1H, d, J 8.0 Hz, C-CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 14.0, 19.8, 49.4, 66.1 134.0, 135.3, 136.0, 128.1, 141.1, 164.7, 157.9, 168.6, 175.5**.**



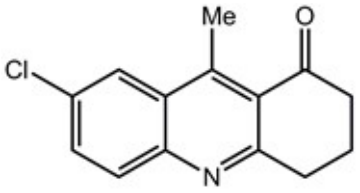
9-methyl 1,2,3,4 tetrahydroacridine was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate: hexane (2 : 98, R_f= 0.4)) and Melting point(Mp) = 138-141 °C. (13 mg, 94% yield)**,** ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.83–1.89 (4H,m,CH2), 2.29 (3H, s, CH3), 2.61 2.64 (2H, m, C-CH2), 2.79–2.83 (2H, m, N-C-CH2), 7.48–7.52 (1H,m, CH), 7.59–7.63 (1H,m, CH), 7.89 (1H, d, J 8.1 Hz, CH), 8.31 (1H, d, J 8.1 Hz, CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 21.1, 22.5,23.6, 33.8, 35.9, 122.8, 125.4, 128.2, 127.7, 132.9, 140.5, 144.9, 165.0**.**



9-methyl 3,4 dihydro acridine-1(2H) one was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate: hexane (3 : 97, R_f= 0.5)) and Melting point(Mp) = 151-153 °C. (18 mg, 96% yield)**,** ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 2.83–2.89 (2H,m,CH2), 2.29 (3H, s, CH3), 2.61 2.64 (2H, m, C-CH_2), 2.79–2.83 (2H, m, N-C-CH2), 7.48–7.52 (1H,m, CH), 7.59–7.63 (1H,m, CH), 7.89 (1H, d, J 8.1 Hz, CH), 8.31 (1H, d, J 8.1 Hz, CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 21.1, 22.5,23.6, 33.8, 35.9, 122.8, 125.4, 128.2, 127.7, 132.9, 140.5, 144.9, 165.0**.**



7-chloro, 9-methyl 1,2,3,4 di hydro acridine was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate: hexane (2 : 98, R_f= 0.5)) and Melting point(Mp) = 159 °C. (8 mg, 89% yield)**,** ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 1.83–1.89 (4H,m,CH2), 2.29 (3H, s, CH3), 2.61 2.64 (2H, m, C-CH2), 2.79–2.83 (2H, m, N-C-CH_2), 7.58–7.62 (1H,m, CH), 7.69–7.83 (1H,m, CH), 7.89-8012 (1H, d, J 8.1 Hz, CH), 8.31-8.51 (1H, d, J 8.1 Hz, CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 21.1, 22.5, 23.6, 33.8, 35.9, 132.8, 143.4, 148.2, 137.7, 151.9, 150.5, 154.9, 175.0**.**



7-chloro, 9-methyl 3,4di hydro acridine-1(2H)one was synthesized by general procedure (mentioned in manuscript) and was purified by solvent system ethyl acetate: hexane (2 : 98, R_f= 0.45)) and Melting point(Mp) = 163 °C. (14 mg, 92% yield)**,** ^{1}H NMR (400 MHz, DMSO-d6): δ in ppm = 2.83–2.89 (2H,m,CH2), 2.29 (3H, s, CH3), 2.61 2.64 (2H, m, C-CH2), 2.79–2.83 (2H, m, N-C-CH2), 7.58–7.72 (1H,m, CH), 7.69–7.83 (1H,m, CH), 7.89-8.10 (1H, d, J 8.1 Hz, CH), 8.31-8.55 (1H, d, J 8.1 Hz, CH); ^{13}C NMR (100 MHz, DMSO-d6): δ in ppm = 21.1, 22.5, 23.6, 33.8, 35.9, 132.8, 145.4, 148.2, 133.7, 148.9, 150.5, 164.9, 175.0**.**