**Iodine‐DMSO Catalyzed aromatization of Polysubstituted Cyclohexanone derivatives; An efficient methods for the synthesis of polyfunctionized Biaryls derivatives**

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**General Information**

General methods All the reagents were commercially available and were used without further purification. All reagents were purchased from Sigma Aldrich, Acros, Alfa Aesar and Avra chemical, S.D. Fine chemical Analytical thin-layer chromatography was performed on silica gel using silica gel (100-200 mesh). Solvent were dried including distilled over A4 molecular sieves prior to use. DMSO dried over activated A4 molecular sieves prior to use. 1H NMR, 13C NMR spectra were recorded with tetramethylsilane (TMS) as internal standard at ambient temperature at Bruker 300, 400, for 1H NMR and 75 & 100 MHz for 13C NMR. FT-IR data collected over spectrometer. Analytical LC-MS, were performed on mass spectrometer connected to an Acquity Qda detector, 2489 UV/ Vis detector, GC-MS data collected on AOS-20i Auto injector Shimadu GC/MS system mass spectrometer.

**Experimental Section:**

**General procedure for preparation of 1,1'-(1,1'-(4'-fluoro-5-methyl-3-oxo- 1,2,3,4-tetrahydro-[1,1'-biphenyl]-2,6-diyl)bis(ethan-1-one)(2A)**

Semisolid; 1H NMR (400 MHz, CDCl3) δ 7.18 (d, J= 3.3 Hz, 2H), 7.00 (t, J = 8.6 Hz, 2H), 6.18 (s, 1H), 2.27 (s, 3H), 1.96 (s, 3H), 1. .89 (d, J = 1.4 Hz, 3H).δ C (101 MHz, CDCl3) 204.72, 191.36,180 .08, 163.13, 160.69, 149.07, 138.06, 128.66, 128.58, 125.18,115.8 115.59, 104.26, 62.95, 41.10, 28.02, 24.55, 22.61

**1,1'-(3',4'-dimethoxy-5-methyl-3-oxo-1,2,3,6-tetrahydro-[1,1'-biphenyl]-2,6- diyl)bis(ethan-1-one) (2D).**

White solid, m.p. 57 °C, 1H NMR (300 MHz, cdcl3) δ 7.59 (d, J =1 .4Hz, 1H), 7.37 (d, J = 8.3 Hz, 1H), 7.34 (s, 1H), 5.95(s, 1H), 4.43 4.43 (s, 3H), 4.39 (s, 3H), 4.02 (d, J = 15.2 Hz, 1H), 3.66 (d, J = 15 .2 Hz, 1H), 2.67 (s, 3H), 2.02 (s, 3H); C (75 MHz, CDCl3) 203.75, 198.44, 191.92, 157.45, 152.52, 148.03, 143.71, 126.21, 129.46, 114.14, 110.52, 70 .72, 57.35, 56.16, 56.73, 29.5, 28.54, 20.2, 19.78

**General procedure for preparation of 1,1'-(4'-fluoro-3-hydroxy-5-methyl-[1,1'-biphenyl]-2,6-diyl)bis(ethan-1-one**

In a dry 10 ml round bottam flask take 1 equiv of compound in DMSO, add 0.25 equiv of I2 and Pd/C 10 %( 20%). The reaction mixture was heated at 90 °C for 3 h, after completion of reaction, monitored by TLC, cool the reaction mixture at room temp and add chilled saturated sodium thiosulphate solution, solid filter out dry over vacuum and purified by column chromatography ( Ethyl acetate: hexane)

**1,1'-(4'-fluoro-3-hydroxy-5-methyl-[1,1'-biphenyl]-2,6-diyl)bis(ethan-1-one)(3A).**

Semisolid, (254 mg, 72%); FTIR (cm-1): 1H NMR (400 MHz, CDCl3) δ 16.24 (s,1H), 7.43 – 7.38 (m, 2H), 7.23(t, J = 8.6 Hz, 2H), 6.41 (s, 1H), 2.50 (s, 3H), 2.19 (s, 3H), 2.12 (d, J = 1.4 Hz, 3H).δ C (75 MHz, dmso) 205.52, 204.52, 161.16, 144.45, 137.09, 130.98, 129.98, 28.66, 124.66, 115.68, 115.21, 109.54, 34.79, 30.41, 29.85, 27.90, 25.12;

**1,1'-(3-hydroxy-5-methyl-[1,1'- biphenyl]-2,6-diyl)bis(ethan-1-one) (3B)**

Faint yellow solid, m.p. 89-92 °C, FTIR (cm-1): 3436, 3019, 2363, 1693, 1631; 1H NMR (300MHz, DMSO+d6), δ 16.47, (s,1H, OH), 7.45–7.42 (m, 3H, 7.30–7.26 (m, 2H), 6.85 (s, 1H), 2.26 (s, 3H, CH3), 1.71 and 1.70 (two s, 6H, COCH3) 13C NMR δ H (75 MHz, dmso) 205.60, 204.19, 139.08, 133.09, 130.94, 129.50, 128.96, 128.9 0, 128.61, 128.20, 124.12, 109.66, 31.74, 30.88, 27.81, 25.32

**1,1'-(3-hydroxy-4'-methoxy-5-methyl-[1,1'-biphenyl]-2,6-diyl)bis(ethan-1-one(3C)**

Yellow liquid; 1H NMR (300 MHz, CDCl3) δ 16.27 (s, 1H), 7.11 (d, J = 8.6 Hz, 2H), 6.82 (d, J = 8.7 Hz, 2H), 6.16 (s, 1H), 3.79 (s, ,3H), 2.26 (s, 3H), 1.94 (s, 3H), 1.86 (s, 3H)

**1,1'-(3-hydroxy-3',4'-dimethoxy-5-methyl-[1,1'-biphenyl]-2,6-diyl)bis(ethan-1- one(3D)**

1HNMR (300 MHz, CDCl3) δ 16.15 (s, 1H), 7.53 (d, J = 1.4Hz,1 H), 7.29 (dt, J = 13.3, 4.9 Hz, 2H), 6.60 (s, 1H), 4.36 (s, 3H),4.33 (s, 3H), 3.13 (s, 3H), 2.60 (s, 3H), 1.96 (s, 3H)

**1,1'-(4'-chloro-3-hydroxy-5-methyl-[1,1'-biphenyl]-2,6-diyl)bis(ethan-1-one (3F)**

Light yellow solid. M.P.142–144 °C. IR (KBr): 3733, 3498, 29 75, 2914, 1699, 1597 1H NMR (300 MHz, cdcl3) δ 16.25 (s, 1H 7.29 (s, 7H), 7.13 (d, J = 8.6 Hz, 4H), 6.16 (d, J = 1.5 Hz, 3H), 2.25 (s, 8H), 1.94 (s, 8H), 1.88 (s, 10H); 13CNMR (75 MHz CHC l3), d 206.1, 206.0, 161.7, 141.3, 138.4, 137.8, 136.0, 135.8 131.9, 129.5, 119.8, 109 .9, 32.3, 32.0, 20.4 MS (ESI+): m/z: 303.5 [M+H]+ 304.























