Supporting Information

Efficient Catalytic-free Method to α -Aryl Cycloalkanones through High **Chemoselective Coupling of Aryl Compounds with Oxyallyl Cations**

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1. Structure determination of compounds 11 and 22.

2. Copies of ¹H NMR, ¹³C NMR, DEPT, COSY, HMQC and HMBC et al.

1. Structure Determination of Compounds 11 and 22

2-(1-hydroxynaphthalen-4-yl)cyclopentanone (11):

¹H NMR (400 MHz, CDCl₃) δ = 8.22 - 8.08 (m, 1H), 7.78 (dd, *J* = 8.4, 3.4 Hz, 1H), 7.57 - 7.34 (m, 2H), 6.96 (dd, *J* = 9.8, 7.9 Hz, 1H), 6.59 (dd, *J* = 15.7, 7.8 Hz, 1H), 5.99 (brs, 1H), 4.06 - 3.88 (m, 1H), 2.71 - 2.53 (m, 2H), 2.53 - 2.36 (m, 1H), 2.30 - 2.10 (m, 2H), 2.10 - 1.89 (m, 1H) ppm.

¹³C NMR (101 MHz, CDCl₃) δ = 221.02, 151.09, 132.87, 127.01, 126.41, 125.37, 125.12, 124.74, 123.33, 122.64, 108.31, 52.34, 39.10, 32.48, 21.06 ppm.



¹H and ¹³C NMR chemical shifts assignment for compound 11

2-((2-methyl-5-(2-oxocyclopentyl)quinolin-8-yl)oxy)cyclopentanone (22):

¹H NMR (400 MHz, CDCl₃) δ = 8.08 (dd, *J* = 11.5, 8.8 Hz, 1H), 7.31 (dd, *J* = 8.7, 3.2 Hz, 1H), 7.20 – 7.08 (m, 2H), 5.07 – 4.82 (m, 1H), 3.92 (dd, *J* = 18.8, 8.8 Hz, 1H), 2.76 (d, *J* = 2.1 Hz, 3H), 2.67 – 2.49 (m, 3H), 2.49 – 2.33 (m, 3H), 2.33 – 2.13 (m, 4H), 2.13 – 1.98 (m, 1H), 1.98 – 1.80 (m, 1H) ppm.

¹³C NMR (101 MHz, CDCl₃) δ = 218.07, 217.80, 214.13, 213.94, 157.91, 157.86, 152.57, 152.51, 140.74, 140.52, 132.69, 132.52, 128.47, 128.26, 126.70, 126.58, 124.15, 123.85, 122.30, 122.21, 113.27, 112.37, 81.38, 81.16, 51.47, 51.07, 38.71, 38.61, 35.44, 35.39, 31.80, 31.69, 29.40, 25.40, 21.04, 21.02, 17.22 ppm.



¹H and ¹³C NMR chemical shifts assignment for compound 22

2. Copies of ¹H NMR, ¹³C NMR, DEPT, COSY, HMQC and HMBC et al.

Compound **11**, ¹H NMR





Compound **11, HMQC**



Compound **11, HMBC**













Compound **1**, ¹³C NMR



Compound **3**, ¹**H** NMR





240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm

Compound 4, HMQC



Compound **6**, ¹³**C** NMR







Compound **7**, ¹³**C** NMR



Compound 7, DEPT 135









Compound **10**, ¹³C NMR







240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 ppm



















Compound 24, ¹H NMR









Compound 26, DEPT 135





