SUPPLEMENTARY INFORMATION

Design and synthesis of pyrano[2,3-*a*]carbazoles by multicomponent reaction

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2-Amino-8-methyl-4-(4'-methoxyphenyl)-5,6-dihydro-11*H*-pyrano[2,3-*a*]carbazol-3-carbonitrile (5a)

Yellow solid; m.p. 240 °C; Yield : 85%; IR (KBr, cm⁻¹) $\nu_{\max}$: 3400 (asym,NH₂), 3341 (sym, NH₂), 3237 (NH), 2208 (CN); ¹H-NMR (400 MHz,CDCl₃) (ppm) δ_{H} : 2.44 (s, 3H, C₈-CH₃), 2.68-2.71 (m, 2H, C₅-2H), 2.80-2.84 (m, 2H, C₆-2H), 3.93 (s, 3H, C₄'-OCH₃), 4.22(s, 1H, C₄-H), 5.12 (s,2H,NH₂), 6.85-7.36 (m, 7H, C₇,C₉,C₁₀,C₂',C₃',C₅' & C₆'-H), 9.23 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_{C} : 20.05, 25.17, 33.03 (2C), 54.10 (OCH₃), 60.14, 112.37, 114.51 (2C), 117.22, 119.45, 122.03, 123.00, 123.30, 125.01,128.15, 130.71, 132.31, 132.54, 135.00 (2C), 148.65, 157.32, 174.61; MS : m/z(%) (M⁺, 100) 383; Anal .Calcd. for C₂₄H₂₁N₃O₂: C, 75.18; H, 5.52 ; N, 10.96. Found: C, 75.24, H, 5.48, N, 11.00 %.

2-Amino-8-methyl-4-(4'-methylphenyl)-5,6-dihydro-11*H*-pyrano[2,3-*a*]carbazol-3-carbonitrile (6a)

Yellow solid; m.p.255: 275-277 °C;Yield : 95%; IR (KBr, cm⁻¹) $\nu_{\max}$: 3439 (asym,NH₂), 3395 (sym, NH₂), 3274 (NH), 2206 (CN); ¹H-NMR(400 MHz,CDCl₃) (ppm) δ_{H} : 2.17 (s,3H,C₄'-CH₃), 2.45 (s, 3H,C₈-CH₃), 2.62-2.70 (m,2H,C₅-2H), 2.74-2.86 (m, 2H, C₆-2H), 4.42 (s, 1H, C₄-H), 5.12 (s, 2H, NH₂), 7.13-7.43 (m, 7H, C₇,C₉,C₁₀,C₂',C₃',C₅' & C₆'-H), 9.24 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_{C} : 19.62, 22.10, 24.34, 30.46 (2C), 58.42, 110.65 (2C), 113.03, 116.85, 122.11, 122.33, 123.25, 128.35, 129.12, 129.15, 129.17, 129.21,

134.17, 134.31, 135.67 (2C), 145.27, 177.56; MS : m/z (%) (M^+ , 100) 367; Anal .Calcd. for $C_{24}H_{21}N_3O$: C, 78.45; H, 5.76 ; N, 11.44. Found: C, 78.40, H, 5.80, N, 11.40 %.

2-Amino-8-methyl-4-(4'-bromophenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (7a)

Yellow solid; m.p.227 °C; Yield : 70%; IR (KBr, cm^{-1}) ν_{max} : 3410 (asym,NH₂) , 3347 (sym, NH₂), 3244 (NH), 2207 (CN); ¹H-NMR (400 MHz,CDCl₃) (ppm) δ_H : 2.45 (s, 3H,C₈-CH₃), 2.80-2.84 (m, 2H, C₅-2H), 2.96-2.99 (m, 2H, C₆-2H), 4.51(s, 1H, C₄-H), 5.15 (s, 2H, NH₂), 7.14-7.67 (m, 7H, C₇,C₉,C₁₀,C_{2'} ,C_{3'} ,C_{5'} & C_{6'} -H), 9.23 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_c : 19.57, 24.35, 33.44 (2C), 56.14, 110.01, 113.51(2C), 118.32, 119.52, 122.15, 123.02, 125.02, 129.05, 132.20, 132.38, 132.41, 132.73, 135.00 (2C), 136.74, 146.79, 174.62; MS: m/z (%) (M^+ , 100) 433, (M+2) 435; Anal .Calcd. for $C_{23}H_{18}BrN_3$: C, 63.90; H, 4.20; N, 9.72. Found: C, 63.85, H, 4.25, N, 9.69 %.

2-Amino-8-methyl-4-(thiophen-2'-yl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (8a)

Yellow solid; m.p.237 °C; Yield : 65%; IR (KBr, cm^{-1}) ν_{max} :3429 (NH₂ & NH merged broad band), 2201 (CN); ¹H-NMR (400 MHz,CDCl₃) (ppm) δ_H : 2.45 (s, 3H,C₈-CH₃) , 2.60-2.65 (m, 2H, C₅-2H), 2.80-2.86 (m, 2H, C₆-2H), 4.10(s, 1H, C₄-H), 5.14 (S, 2H, NH₂), 6.06 (d, 1H, C_{2'}-H, J=4.40Hz), 6.67-7.78 (m, 5H, C₇ ,C₉ ,C₁₀ ,C_{3'} & C_{4'} -H), 9.21 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_c : 19.42, 25.10, 28.17 (2C), 56.44, 102.27, 108.61, 111.03, 113.25 (2C), 118.08, 119.33, 123.11, 125.02, 128.09, 132.10 (2C), 132.52, 144.67, 150.35, 175.44; MS : m/z (%) (M^+ , 100) 359; Anal .Calcd. for $C_{21}H_{17}N_3OS$:C, 70.17; H, 4.77 ; N, 11.69; S,8.92. Found: C, 70.21, H, 4.82, N, 11.76; S, 8.88 %.

2-Amino-10-methyl-4-(4'-methoxyphenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (5b)

Yellow solid; m.p. 260°C; Yield:87%; IR (KBr, cm^{-1}) ν_{max} : 3461 (NH_2 & NH merged broad band), 3376 (NH), 2207 (CN); $^1\text{H-NMR}$ (400 MHz, CDCl_3) (ppm) δ_{H} : 2.58 (s, 3H, $\text{C}_{10}\text{-CH}_3$), 2.88-2.86 (m, 2H, $\text{C}_5\text{-2H}$), 2.74-2.72 (m, 2H, $\text{C}_6\text{-2H}$), 3.89 (s, 3H, $\text{C}_4'\text{-OCH}_3$), 4.05 (s, 1H, $\text{C}_4\text{-H}$), 5.16 (s, 2H, NH_2), 7.45-7.06 (m, 7H, $\text{C}_7, \text{C}_8, \text{C}_9, \text{C}_2', \text{C}_3', \text{C}_5'$ & $\text{C}_6'\text{-H}$), 9.33 (b s, 1H, $\text{N}_{11}\text{-H}$); $^{13}\text{C NMR}$ (100 MHz, CDCl_3) (ppm) δ_{C} : 19.70, 24.03, 34.28 (2C), 53.70 (OCH_3), 61.29, 112.10, 112.59, 113.44 (2C), 113.51, 118.55, 124.02, 125.12, 126.09, 127.12, 131.52, 132.55, 132.75, 136.00 (2C), 148.91, 156.58, 172.28; MS: m/z (%) (M^+ , 100) 383; Anal.Calcd. for $\text{C}_{24}\text{H}_{21}\text{N}_3\text{O}_2$: C,75.18; H,5.52; N,10.96. Found: C,75.22; H,5.48; N,11.87%.

2-Amino-10-methyl-4-(4'-methylphenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (6b)

Yellow solid; m.p. 272°C; Yield:90%; IR (KBr, cm^{-1}) ν_{max} : 3459 (asym, NH_2), 3349 (sym, NH_2), 3238 (NH), 2210 (CN); $^1\text{H-NMR}$ (400 MHz, CDCl_3) (ppm) δ_{H} : 2.45 (s, 3H, $\text{C}_{10}\text{-CH}_3$), 2.58 (s, 3H, $\text{C}_4'\text{-CH}_3$), 2.85 (m, 2H, $\text{C}_5\text{-2H}$), 2.71 (m, 2H, $\text{C}_6\text{-2H}$), 4.10 (s, 1H, $\text{C}_4\text{-H}$), 5.16 (s, 2H, NH_2), 7.51-7.20 (m, 7H, $\text{C}_7, \text{C}_8, \text{C}_9, \text{C}_2', \text{C}_3', \text{C}_5'$ & $\text{C}_6'\text{-H}$), 9.32 (b s, 1H, $\text{N}_{11}\text{-H}$); $^{13}\text{C NMR}$ (100 MHz, CDCl_3) (ppm) δ_{C} : 18.47, 23.13, 23.56, 32.25 (2C), 57.34, 111.14 (2C), 116.75, 117.54, 120.43, 121.25, 124.53, 126.15, 129.14, 129.15, 129.17, 129.23, 133.17 (2C), 134.15, 134.33, 145.25, 175.55; MS: m/z (%) (M^+ , 100) 367; Anal.Calcd. for $\text{C}_{24}\text{H}_{21}\text{N}_3\text{O}$: C,78.45; H,5.76; N,11.44. Found: C,78.38; H,5.65; N,11.56%.

2-Amino-10-methyl-4-(4'-bromophenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (7b)

Yellow solid; m.p.235°C; Yield: 71%; IR (KBr, cm^{-1}) ν_{max} : 3463 (asym, NH_2), 3335(sym, NH_2), 3205 (NH), 2212 (CN); $^1\text{H-NMR}$ (400 MHz, CDCl_3) (ppm) δ_{H} : 2.58 (s, 3H, $\text{C}_{10}\text{-CH}_3$), 2.86-2.84 (m, 2H, $\text{C}_5\text{-2H}$), 2.69-2.65 (m, 2H, $\text{C}_6\text{-2H}$), 4.02 (s, 1H, $\text{C}_4\text{-H}$), 5.19 (s, 2H, NH_2), 7.66-7.10 (m, 7H, $\text{C}_7, \text{C}_8, \text{C}_9, \text{C}_2', \text{C}_3', \text{C}_5'$ & $\text{C}_6'\text{-H}$), 9.32 (b s, 1H, $\text{N}_{11}\text{-H}$); $^{13}\text{C NMR}$ (100 MHz, CDCl_3) (ppm) δ_{C} : 20.10, 23.32, 32.37 (2C), 55.17, 114.28 (2C), 118.55, 119.05, 120.01, 121.11, 122.52, 124.05, 126.33, 132.45, 132.61, 132.84, 133.22 134.22 (2C), 135.62, 147.51, 175.73; MS: m/z (%) (M^+ , 100) 353, ($\text{M}+2$) 353; Anal.Calcd. for $\text{C}_{23}\text{H}_{18}\text{N}_3\text{O}$: C,78.39; H,5.15; N,11.92;. Found: C,78.35; H, 5.13;N, 11.94%.

2-Amino-10-methyl-4-(thiophen-2'-yl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (8b)

Brown solid; m.p. 238°C; Yield: 67%; IR (KBr, cm^{-1}) ν_{max} : 3434 (asym, NH_2), 3343 (sym, NH_2), 2209 (CN); $^1\text{H-NMR}$ (400 MHz, CDCl_3) (ppm δ_{H}): 2.45 (s, 3H, $\text{C}_{10}\text{-CH}_3$), 2.84-2.86 (m, 2H, $\text{C}_5\text{-2H}$), 2.63-2.65 (m, 2H, $\text{C}_6\text{-2H}$), 4.01(s, 1H, $\text{C}_4\text{-H}$), 5.14 (s, 2H, NH_2), 7.17-7.25 (m, 6H, $\text{C}_7, \text{C}_8, \text{C}_9, \text{C}_3', \text{C}_4'$ & $\text{C}_5'\text{-H}$), 9.25 (b s, 1H, $\text{N}_{11}\text{-H}$); $^{13}\text{C NMR}$ (100 MHz, CDCl_3) (ppm) δ_{C} : 19.38, 24.57, 26.86 (2C), 55.27, 103.22, 108.35, 110.05, 112.37 (2C), 116.55, 118.76, 122.06, 124.42, 125.61, 133.15 (2C), 138.73, 145.83, 151.63, 176.51; MS: m/z (%) (M^+ , 100) 359; Anal.Calcd. for $\text{C}_{21}\text{H}_{17}\text{N}_3\text{OS}$: C,70.17, H,4.77, N,11.69; S,8.92. Found: C,70.22; H,4.82; N,11.65; S,8.82.

2-Amino-8-chloro-4-(4'-methoxyphenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (5c)

Yellow solid; m.p.275 °C; Yield : 87%; IR (KBr, cm^{-1}) ν_{max} : 3419 (asym, NH_2), 3342 (sym, NH_2), 3236 (NH), 2210 (CN) ; $^1\text{H-NMR}$ (400 MHz, CDCl_3) (ppm) δ_{H} : 2.69-2.73 (m, 2H, $\text{C}_5\text{-2H}$), 2.78-2.83 (m, 2H, $\text{C}_6\text{-2H}$), 3.93 (s, 3H, $\text{C}_4'\text{-OCH}_3$), 4.25(s, 1H, $\text{C}_4\text{-H}$), 5.15 (s, 2H,

NH₂), 6.97-7.53 (m, 7H, C₇, C₉, C₁₀, C₂, C₃', C₅' & C₆'-H), 9.36 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_c : 25.07, 33.22 (2C), 55.44 (OCH₃), 58.94, 112.44, , 113.38 (2C), 114.24, 115.02, 119.42, 122.17, 123.23, 124.05, 126.14, 131.55, 132.82, 133.01, 134.00 (2C), 144.77, 158.55, 175.65; MS : m/z(%) (M⁺, 100) 403, (M+2) 405 ; Anal .Calcd. for C₂₃H₁₈ ClN₃O₂ :C, 68.40; H, 4.49 ; N, 10.40. Found: C, 68.35, H, 4.54, N, 10.44 %.

2-Amino-8-chloro-4-(4'-methylphenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (6c)

Yellow solid; m.p.282 °C; Yield : 90%; IR (KBr, cm⁻¹) ν_{max}:3422 (asym,NH₂) ,3348 (sym NH₂), 3237 (NH), 2211 (CN); ¹H-NMR (400 MHz,CDCl₃) (ppm) δ_H :2.44 (s, 3H, C₄'-CH₃), 2.67-2.72 (m, 2H, C₅-2H), 2.77-2.82 (m, 2H, C₆-2H), 4.07(s, 1H, C₄-H), 5.15 (s, 2H, NH₂), 7.17-7.53 (m, 7H, C₇, C₉, C₁₀, C₂', C₃', C₅' & C₆'-H), 9.36 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_c : 21.10, 23.75, 31.55 (2C), 57.44, 112.13, 112.35 (2C), 118.25, 120.33, 122.31, 124.15, 126.17, 129.10, 129.14, 129.17, 129.23, 133.65 (2C), 134.15, 134.28, 144.25, 176.54; MS : m/z(%) (M⁺, 100) 387 , (M+2) 389 ; Anal .Calcd. for C₂₃H₁₈ ClN₃O: C,71.22; H,4.68 ; N, 10.83. Found: C,71.18, H, 4.73, N, 10.75 %.

2-Amino-4-(4'-bromophenyl)-8-chloro-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (7c)

Yellow solid; m.p.243°C; Yield : 72%; IR (KBr, cm⁻¹) ν_{max}:3460 (asym,NH₂) ,3344 (sym, NH₂), 3233 (NH), 2210 (CN) ; ¹H-NMR (400 MHz,CDCl₃) (ppm) δ_H: 2.64-2.68 (m, 2H, C₅-2H), 2.79-2.83 (m, 2H, C₆-2H), 4.06(s, 1H, C₄-H), 5.18 (s, 2H, NH₂), 7.17-7.68 (m, 7H, C₇, C₉, C₁₀, C₂', C₃', C₅' & C₆'-H), 9.35 (b s, 1H, N₁₁-H); ¹³C NMR (100 MHz, CDCl₃) (ppm) δ_c : 23.71, 35.15 (2C), 54.38, 110.03, 111.51 (2C), 116.82, 120.11, 122.07, 122.11 125.45, 126.25, 132.33, 132.45, 132.55, 132.72, 134.44 (2C), 136.69, 143.05, 174.77; MS: m/z (%) (M⁺, 100)

452, (M+2) 454, (M+4) 456; Anal. Calcd. for $C_{22}H_{15}BrClN_3O$:C, 58.36; H, 3.34 ; N, 9.28.
Found: C, 58.42, H, 3.30, N, 9.31 %.

2-Amino-8-chloro-4-(thiophen-2'-yl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (8c)

Yellow solid; m.p. 233-235 °C; Yield : 60%; IR (KBr, cm^{-1}) ν_{max} : 3343 (asymm and symm NH_2 merged broad band), 3100 (NH), 2202 (CN) ; 1H -NMR (400 MHz, $CDCl_3$) (ppm) δ_H : 2.64-2.67 (m, 2H, C_5 -2H), 2.89-2.93 (m, 2H, C_6 -2H) , 4.15(s, 1H, C_4 -H), 5.18 (s, 2H, NH_2), 6.09 (d, 1H, C_2' -H, $J=4.80Hz$), 6.85-7.67 (m, 5H, C_7, C_9, C_{10}, C_3' & C_4' -H), 8.73 (b s, 1H, N_{11} -H); ^{13}C NMR (100 MHz, $CDCl_3$) (ppm) δ_c : 24.35, 29.64 (2C), 55.34, 103.67, 108.35, 112.52 (2C), 114.05, 118.72, 119.07, 123.04, 124.06, 125.12, 133.12 (2C), 138.82, 145.19, 150.55, 174.68; MS : m/z(%) (M^+ , 100) 379, (M+2) 381; Anal .Calcd. for $C_{20}H_{14}ClN_3OS$:C, 63.24; H, 3.71 ; N, 11.06 ;S ,8.44 Found : C, 63,18, H, 3.68, N, 11.11; S, 8.48 %.

2-Amino-4-(4'-methoxyphenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (5d)

Yellow solid; m.p.285 °C; Yield:85%; IR (KBr, cm^{-1}) ν_{max} : 3466 (asym, NH_2), 3377 (sym, NH_2), 3337 (NH), 2210 (CN); 1H -NMR (400 MHz, $CDCl_3$) (ppm) δ_H : 2.88-2.86 (m, 2H, C_5 -2H), 2.72-2.70 (m, 2H, C_6 -2H), 3.89 (s, 3H , C_4' - OCH_3) , 4.05 (s, 1H, C_4 -H), 5.16 (s, 2H, NH_2) ,7.60-7.06 (m, 8H, $C_7, C_8, C_9, C_{10}, C_2', C_3', C_5'$ & C_6' -H), 9.34 (b s, 1H, N_{11} -H); ^{13}C NMR (100 MHz, $CDCl_3$) (ppm) δ_c : 26.10, 34.61(2C), 54.55 (OCH_3), 60.57, 111.01, 112.66, 113.29, 115.04 (2C), 115.81, 122.02, 124.08, 124.11, 125.00, 130.70, 132.62, 133.31, 137.22 (2C), 145.53, 157.56, 174.33; MS: m/z(%) (M^+ ,100) 369; Anal. Calcd. for $C_{23}H_{19}N_3O_2$: C,74.78; H,5.13; N,11.37; .Found: C,74.82; H,5.20; N,11.35%

2-Amino-4-(4'-methylphenyl)-5,6 dihydro-11H-pyran[2,3-a]carbazol-3-carbonitrile (6d)

Yellow solid; m.p 277 °C; Yield: 90%; IR (KBr, cm^{-1}) ν_{max} 3450 (asym, NH_2), 3349 (sym, NH_2), 3285(NH), 2210 (CN) ; ^1H - NMR (400 MHz, CDCl_3) (ppm) δ_{H} : 2.45 (s, 3H, C_4' - CH_3), 2.87-2.85 (m, 2H, C_5 -2H), 2.70-2.69 (m, 2H, C_6 -2H), 4.05 (s, 1H, C_4 -H), 5.16 (s, 2H, NH_2), 7.59-7.17 (m, 8H, C_7 , C_8 , C_9 , C_{10} , C_2' , C_3' , C_5' & C_6' -H), 9.34(b s, 1H, N_{11} -H); ^{13}C NMR (100 MHz, CDCl_3) (ppm) δ_{C} : 20.01, 24.27, 32.28 (2C), 56.42, 112.12 (2C), 116.72, 118.54, 120.75, 121.44, 125.56, 126.15, 129.12, 129.17, 129.19, 129.21, 131.21 (2C), 134.12, 134.35, 147.22, 174.52; MS: $m/z(\%)$ (M^+ , 100) 353; Anal. Calcd. for $\text{C}_{23}\text{H}_{19}\text{N}_3\text{O}$: C, 78.16; H, 5.42; N, 11.89; Found: C, 78.10; H, 5.45; N, 11.85%.

2-Amino-4-(4'-bromophenyl)-5,6-dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (7d)

Yellow solid; m.p. 253 °C; Yield: 70%; IR (KBr, cm^{-1}) ν_{max} : 3463 (asym, NH_2), 3335 (sym, NH_2), 3205 (NH), 2212 (CN); ^1H -NMR (400 MHz, CDCl_3) (ppm) δ_{H} : 2.86-2.85 (m, 2H, C_5 -2H), 2.67-2.65 (m, 2H, C_6 -2H), 4.01 (s, 1H, C_4 -H), 5.19 (s, 2H, NH_2), 7.68-7.18 (m, 8H, C_7 , C_8 , C_9 , C_{10} , C_2' , C_3' , C_5' & C_6' -H), 9.34(b s, 1H, N_{11} -H); ^{13}C NMR (100 MHz, CDCl_3) (ppm) δ_{C} : 25.05, 32.27 (2C), 55.21, 113.22, 114.15 (2C), 119.12, 119.35, 121.58, 123.22, 124.00, 125.01, 132.33, 132.41, 132.52, 132.81, 136.02 (2C), 137.42, 145.01, 175.54; MS: $m/z(\%)$ (M^+ , 100) 418; Anal. Calcd. for $\text{C}_{22}\text{H}_{16}\text{BrN}_3\text{O}$: C, 63.17; H, 3.86; N, 10.08; Found: C, 63.11; H, 3.90; N, 10.12 %.

2-Amino-4-(thiophen-2'-yl)-5,6 dihydro-11H-pyrano[2,3-a]carbazol-3-carbonitrile (8d)

Brown solid; m.p. 243 °C; Yield: 65%; IR (KBr, cm^{-1}) ν_{max} : 3434, 3345 (NH_2 & NH merged broad band), 2210 (CN) ; ^1H -NMR (400 MHz, CDCl_3) (ppm) δ_{H} : 2.80-2.87 (m, 2H, C_5 -2H), 2.60-2.61 (m, 2H, C_6 -2H), 4.01 (s, 1H, C_4 -H), 5.14 (s, 2H, NH_2), 7.04-7.14 (m, 7H, C_7 , C_8 , C_9 , C_{10} , C_3' , C_4' & C_5' -H), 9.27 (b s, 1H, N_{11} -H); ^{13}C NMR (100 MHz, CDCl_3) (ppm) δ_{C} : 23.59, 28.33 (2C), 57.17, 103.55, 108.37, 112.05, 114.11, (2C), 119.41, 120.09, 121.11, 124.04,

125.15, 131.00 (2C), 139.55, 146.42, 152.36, 175.46; MS: m/z(%) (M^+ ,100) 345; Anal. Calcd. for $C_{20}H_{15}N_3OS$: C,69.54; H,4.38; N,12.17;S,9.28. Found: C,69.52; H,4.42; N,12.12; S,9.30%.