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Synthesis of 4-chloro-2-(thiomorpholin-4-ylmethyl)phenol

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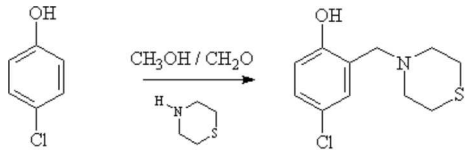

1 **2**

4-chloro-2-(thiomorpholin-4-ylmethyl)phenol (**2**) was prepared from 4-chlorophenol (**1**) and thiomorpholine and formaldehyde (37%) in methanol as solvent . A solution of methanol (50 mL) and 4-chlorophenol **1** (1.26g, 9.80 mmol) was prepared and heated at 40 °C for 15 minutes, after that a solution of thiomorfoline (2.0g, 20.7 mmol) and formaldehyde (1.5 mL, 20.15 mmol) in methanol was added . When the addition was completed, the reaction mixture was stirred at reflux for 24 hrs. The solvent was eliminated using rotavapor and reaction mixture was poured into water and extracted with ehtyl acetate. The product was crystallized after eliminated solvent and recrystallized from ethanol as white powder (**2**) (25% yield).

Melting Point: 127-129 °C (methanol, uncorrected).

IR ($CHCl_3$ film, cm^{-1}): 3502 (O-H); 3010 (C_{sp2}-H Ar); 2985 (C_{sp3}-H).

^{1}H-NMR (300 MHz; $CDCl_3$): δ= 10.56 (1H, s, OH); 7.11 (1H, dd, *J*= 8.7Hz, 2.7Hz); 6.94 (1H, d, *J*= 2.7Hz); 6.74 (1H, d, 8.7Hz); 3.65 (2H, s, Ar-CH_2); 2.81 (4H, m, -S-CH_2-); 2.71 (4H, m, -N-CH_2-).

^{13}C-NMR (75 MHz; $CDCl_3$): δ= 156 (C); 128.56 (CH); 128.31 (CH); 123.61 (C); 122.11(C); 117.37 (CH); 61.63 (Ar-CH_2); 54.27 (-S-CH_2-); 27.73 (-N-CH_2-).

MS (FAB; m/z, %): 244(100%); 215; 180; 154.

Elemental Analysis: Calculated for $C_{11}H_{14}NOSCl$: C, 54.20%; H, 5.79%; N, 5.75%; O, 6.56%; S, 13.15%; Cl, 14.54%. Found: C, 54.40%; H, 5.77%; N, 5.80%; O, 6.45%; S, 13.22%; Cl, 14.49%.

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References
1. Biava, M., Fioravanti, R., Porretta, G.C., Deidda, D., Maullu, C., Pompei M. *Biorg.& Med.Chem.Lett.* **1999**, *9*, 2083-2985.
2. Teipel, S.; Griesar, K.; Haase, W.; Krebs, B. *Inorganic Chemistry* **1994**, *33*, 456-64.
3. Hodgkin, J.H., *Aust .J. Chem*., **1984**, *37*, 2371-2378.