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SYNTHESIS AND CHARACTERISATION OF 5-((4-(2-METHOXYETHYL) PHENOXY) METHYL-2-CHLOROPYRIDINE

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ABSTRACT

Chloropyridine is heterocyclic compound. 2-Chloropyridine is used as a starting material in the production of the antihistamine drug, pheniramine, and the antiarrhythmic, disopyramide. 2-Chloro-5-(chloromethyl)-pyridine reacted with 4(2-Methoxyethyl) Phenol to formed 5-((4-(2-methoxyethyl) phenoxy) methyl-2-Chloropyridine with good yield. The structure of the target compounds was confirmed by 1H NMR, EI-MS.

KEYWORDS: Pyridine, Phenol, NMR, Mass spectra, EI-MS.

INTRODUCTION

Heterocyclic are present in a wide variety of drugs, most vitamins, many natural products, biomolecules, and biologically active compounds, including antitumor, antibiotic, anti-inflammatory, antidepressant, antimalarial, anti-HIV, antimicrobial, antibacterial, antifungal, antiviral, antidiabetic, herbicidal, fungicidal, and insecticidal agents. Also, they have been frequently found as a key structural unit in synthetic pharmaceuticals and agrochemicals.[1]

Pyridine was first isolated and characterized by Anderson in 1846. It was obtained from bone oil and from coal tar. The cyclic nature of pyridine was recognized by Korner and Dewar in 1869.[2] In the pharmaceutical industry, pyridine forms the nucleus of over 7000 existing drugs. In drug discovery pyridine has been a bioisosteric replacement of benzene ring. Literature reports show that pyridine containing compounds possess antioxidant[6], antiviral[7-9], anticancer[10-11], antibacterial[3,10], antidiabetic[11], antichagagic[12] and antifungal[13] and analgesic activities.[14] Numerous pyridine based compounds have been reported to display versatile bioactivity such as insecticidal[15], fungicidal[16], plant growth regulator[17, 18], anticancer[19] and antibacterial activity.[20] Other application of pyridine

include their use as agrochemicals, veterinary products (anthelmintics, antiparasitics and antibacterials) dyestuffs, surfactants and corrosion inhibitors[21] pyridine have also frequently been used as ligands for metals in organic synthesis and often used as chiral ligands for transition metals.[22,23]

pyridine derivatives continue to attract great interest due to the wide variety of interesting biological activities observed in these compounds, such as anticancer, analgesic, antimicrobial,and an- tidepressant, activities.[24, 31] 2-Chloropyridine is used as an intermediate in synthetic organic, pharmaceutical and agricultural chemical (fungicides, herbicides) manufacture. It is also used as a catalyst for phase transfer.[32,33] According to Olin Corp., it is a key intermediate in the manufacture of pyrithione-based biocides for use in cosmetics and various pharmaceutical products.[34] 2-Chloropyridine is used as a starting material in the production of the antihistamine drug, pheniramine, and the antiarrhythmic, disopyramide.[35]

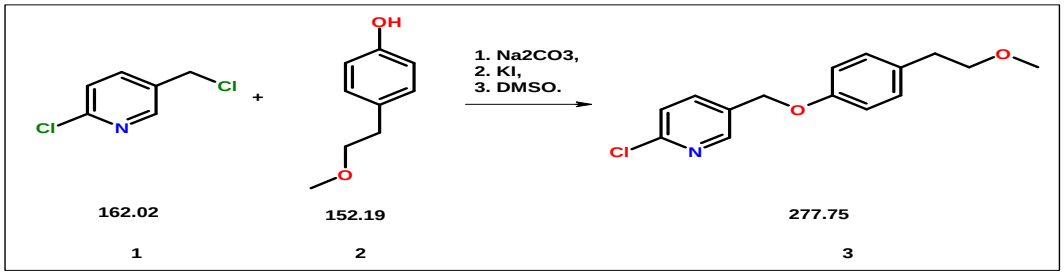
Literature revealed that some thiazolo pyridine derivatives have been reported to posses antibacterial and anti-virulence activities.[36]

MATERIALS AND METHODS

Synthesis of 5-((4-(2-methoxyethyl) phenoxy) methyl-2-Chloropyridine.

5.0 g (32.89 mmol) of 4 (2-Methoxyethyl) phenol, 4.0 g (24.68 mmol) 2-chloro-5(chloromethyl)-pyridine , 60.0 mL DMSO and 6.0 gm sodium carbonate and 1.0 g KI were added in round bottom flask. Reaction mass was stirred at 60.0° C for 3 hr. The reaction mass was cooled to room temperature. Charge 150.0 mL water and 200.0 mL dichloromethane in reaction mass. Separated both layer. Solvent was evaporated and residue was purified by Column Chromatography Hexane/ Ethyl Acetate (9:10 system. Weight of Compound- 4.1 g.

Reaction



Characterization of Compounds

NMR spectra: NMR spectra of synthesized compound has been taken. Instrument used BRUKER AC 400F NMR spectrophotometer 33 HZ with DMSO solvent. The NMR spectra of 5-((4-(2-methoxyethyl) phenoxy) methyl-2-chloropyridine (3) as shown in Fig 1.

RESULTS AND DISCUSSION

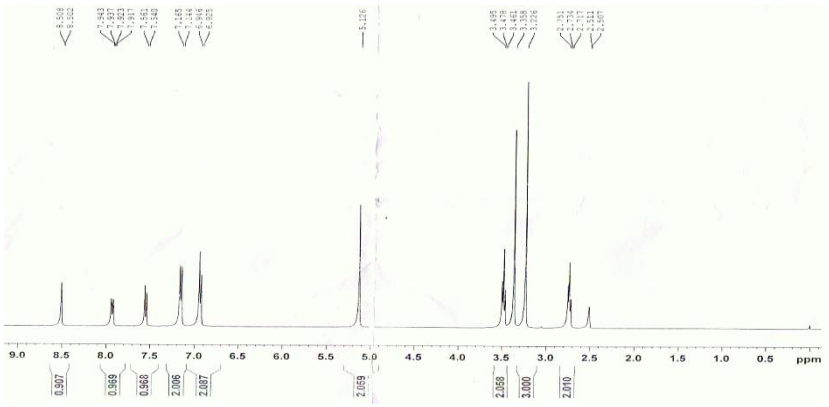


Fig 1: 1H NMR of 5-((4-(2-methoxyethyl) phenoxy)methyl-2-chloropyridine in DMSO

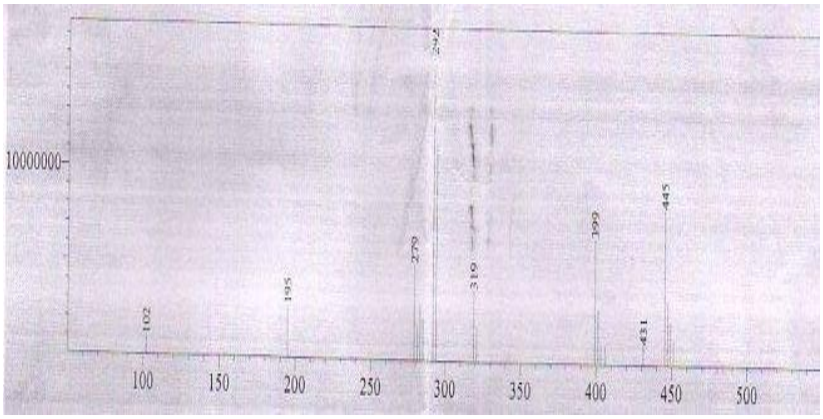


Fig 2: Mass spectra of 5-((4-(2-methoxyethyl) phenoxy)methyl-2-chloropyridine in DMSO

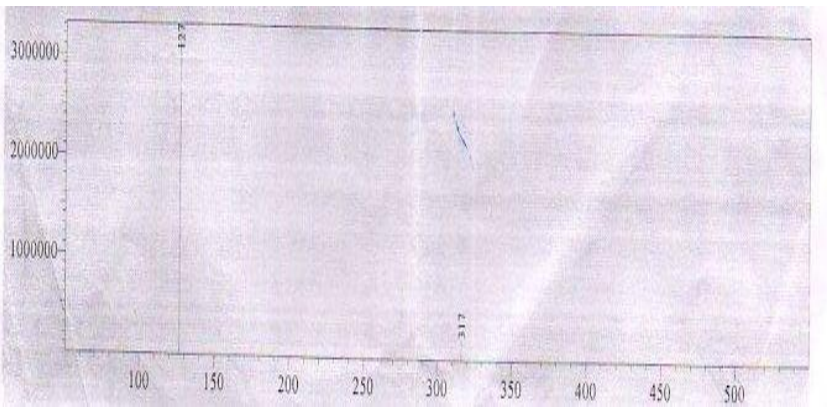


Fig 3: EI-MS of 5-((4-(2-methoxyethyl) phenoxy)methyl-2-chloropyridine in DMSO

5-((4-(2-methoxyethyl) phenoxy)methyl-2-chloropyridine (3) gives 60% yield is about 4.1 g. For 5-((4-(2-methoxyethyl) phenoxy) methyl-2-chloropyridine ^{1}H NMR: 2.71(t, 2H), 3.22 (s, 3H), 3.49 (t, 2H), 5.12 (s, 2H), 6.92 (d, 2H), 7.14 (d, 2H), 7.54 (d,1H), 7.91 (t,1H), 8.50 (d,1H). Mass m/z 279 (M+).

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