

Synthesis of 2-Nicotinoyl 4-Chloro Hydrazinecarbothiomide

A. B. Wadekar¹, V. G. Bhagat²

^{1,2}Department of Chemistry, Shri. Dnyaneshwar Maskuji Burungale Science and Arts College Shegaon, Dist. Buldhana

doi.org/10.64643/IJIRTV12I9-195642-459

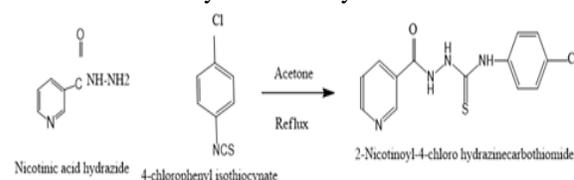
Abstract—Synthesis of active drug molecules has strong demand for huge population of the world, present work deals with the synthesis of 2-Nicotinoyl 4-chloro hydrazinecarbothiomide by the interaction of 4-chloro phenyl isothiocyanate and nicotinic acid hydrazide, in acetone as a solvent. The product thus synthesized in these reactions and characterized on the basis of conventional elemental analysis, chemical characteristics and through IR, PMR, and Mass spectral analysis.

Index Terms—2-Nicotinoyl 4-chloro hydrazine carbothioamide, 4-chloro phenyl isothiocyanate, nicotinic acid hydrazide

I. INTRODUCTION

Population of the world terribly growing along with those basic demands of health and medicine related things. World researchers were pointed their attention toward this aspect and working with challenge toward same. Pathogens are become resistive against existing some drugs moieties thus have a great need to developed more active and potent drugs moieties with good solubility, diffusion and activity that will be demonstrate effective pharmacodynamics and pharmacokinetics of drugs. The literature survey divulges that from last couple of decades' numerous advances, theories and new concepts regarding to synthesis of novel moieties, chemical, physical as well as biological study of benzenoid and non-benzenoid, heterocyclic and heterocyclic compounds were studied¹⁻⁵. These compounds have their own identity and importance in the chemical and life sciences due to their variety of applications in medicinal, agricultural, pharmaceutical, industrial, biotechnological and biochemical sciences⁶⁻¹⁰. If we think about the drugs we can define the history of medicine by these compounds.

In the view of the utilities of these compounds in various fields and as a part of present research work, recently being undertaken in this laboratory in the synthesis of nitrogen, nitrogen and Sulphur containing heterocycles and heterocycles and to investigate their medicinal, pharmaceutical, agricultural, industrial, biotechnological and biochemical significance¹¹⁻¹⁸, hence interactions of 4-chloro phenyl isothiocyanate and nicotinic acid hydrazide in acetone medium, to isolate 2-Nicotinoyl 4-chloro hydrazinecarbothiomide



II. METHODS AND MATERIAL

All AR grade chemicals were used throughout experiment.

Synthesis of 2-Nicotinoyl 4-chloro hydrazine carbothioamide.

2-Nicotinoyl 4-chloro hydrazinecarbothiomide was synthesized by refluxing 4-chloro phenyl isothiocyanate and nicotinic acid hydrazide in acetone medium for 2 hours. After completion of reaction, to isolated 2-Nicotinoyl 4-chloro hydrazinecarbothiomide from solvent. After distillation of acetone the product is isolated which is recrystallized from ethanol to get yellowish colour crystalline solid flakes.

III. RESULT AND DISCUSSION

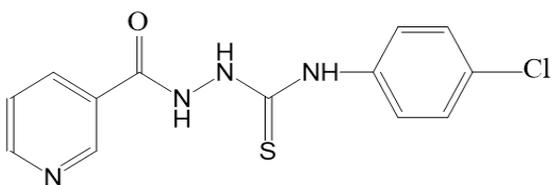
Properties of 2-Nicotinoyl 4-chloro hydrazinecarbothiomide:

The compound is yellowish colour crystalline solid flakes, $C_{15}H_{16}N_4SCl$. It gave positive test for nitrogen, chlorine and Sulphur Desulphurized with alkaline plumbite solution. Soluble in boiled sodium hydroxide, sulphuric acid, 1,4-dioxane, hydrochloric acid and nitric acid and was sparingly soluble in boiled water, ethanol, acetone.

Elemental analysis (%): Found (Calculated) C- 60.07 (62.63), H-5.49 (6.24), N-8.71 (9.13), S-9.82 (10.45), Cl-10.20 (11.55). FTIR spectrum (ν cm^{-1}): - The IR spectrum of compound was carried out in KBr pellets on BRUKER IR spectrometer¹⁹⁻²⁴. 2773.64-2565.33 (Aliphatic C-H stretching), 2902.87 (Aromatic C-H stretching), 1945.82 (N-C=S stretching), 1589.99-1815.02 (C=N stretching), 1897.95 (C=S stretching), 3050.95 (four N-H stretching), 3195.83 (C-O stretching), 1505.55-1294.24 (Aliphatic -H bending), 1070.49-611.43 (Aromatic H bending). PMR spectrum data: The PMR spectrum of a compound was recorded in DMSO on VARIAN MHz 400 NMR spectrometer^{19-20,25-28}. This spectrum distinctly displayed the signals, due to four aromatic protons in the range at δ 7.509 – δ 7.288 ppm of phenyl group, four aromatic protons in the range at δ 7.226 - δ 7.171 ppm, four amino NH protons at δ 9.7422 ppm,

IV. CONCLUSION

Present chemical characteristics, elemental and spectral analysis reveals that the newly synthesized present compound was assigned the structure as 2-Nicotinoyl 4-chloro hydrazinecarbothiomide. This work create scope to studies various chemical, pharmaceutical, agricultural and biological applications of newly synthesized 2-Nicotinoyl 4-chloro hydrazinecarbothiomide.



2-Nicotinoyl 4-chloro hydrazinecarbothiomide

REFERENCES

- [1] Tayade D.T., Bhagwatkar A.K., International Journal of Organic and Bioorganic Chemistry, 4(1), 2014, 6-9.
- [2] Popov V.V., Amelichev S.A., Bushmarinov I.S., Konstantinova L.S. Lyssenko K.A., Mikhailchenko L.V., Novikov V.V., Gulyai V.P., Rakitin O.A., Tetrahedron, 69, 2013, 8790-8797.
- [3] Letska E.V., Turner N.W., Anthony P.F., Tuner and Piletsky S.A., J. Controlled Release, 08(1), 2005, 132.
- [4] Kim G.Y., Shim J., Kang M., Moon S.H., J. Environ. Monti, 10, 2008, 632.
- [5] Dandia A.K., Arya K., Sati M., Synthetic Communication, 34(6), 2004, 1141.
- [6] G. Arabaci, P. Yi, H. Fu, M.E. Morter, Bio-Org. Med. Chem. Letter, 12(2), 2002, 3047-3050.
- [7] S. Nagar, N.H. Singh, J. Med. Chem., 16, 2007, 178-180.
- [8] J. Martin, M. Borodie and P. Kwan, British Medical Journal, 22(1), 2000, 5-7.
- [9] D.J. Faulkner, Tetrahedron Lett, 38, 1993, 21-25.
- [10] R.C. Panpalia, Ph.D. Thesis, S.G.B. Amravati University, Amravati, 2007.
- [11] V. Cyril and M. Milam, Chem. Abstr., 86, 1977, 190015.
- [12] B. Belmut and K. Will, Germ. Offen, 2, 1978, 630, 849.
- [13] K. Alfred and A. Tentawy, Chem. Abstr., 90, 1979, 54914.
- [14] D.T. Tayade, Ph.D. Thesis, S.G.B. Amravati University, Amravati, 1996.
- [15] C.D. Bossinger and E. Tekeshi, Chem. Abstr., 77, 1972, 343590.
- [16] D. Park and Co. Workers, British Patent, 48, 1960, 245.
- [17] M. Sedal and F.E. Betiver, S. African Patent, 68, 1964, 03, 47.
- [18] A.G. Ghaigy (Jr.), Siess Patent, 4, 1980, 186, 265.
- [19] C.N. Banwell, Elaile and Cash Mc, "Fundamentals of Molecular Spectroscopy", 4th Ed. McGraw Hill International U.K., 2003.
- [20] J.R. Dyer, "Applications of Absorption Spectroscopy of Organic Compounds", 8th Ed., Prentice Hall, India, New Delhi, 1991.

- [21] D.V. Pavia, G.M. Lampan and G.S. Kriz, "Introduction to Spectroscopy", 3rd Ed., Thomson Brooks/Cole, Singapore, 2002.
- [22] D.H. Williams and I. Fleming, "Spectroscopic Methods in Organic Chemistry", 4th Ed., TataMc Graw Hill Publishing Company Ltd., New Delhi, 1993.
- [23] A.I. Vogel, "Text book of Practical Organic Chemistry", 4th Ed., E.L.B.S. and Lorgman, India, 1978.
- [24] L.D. Field., S. Sterhell and J.R. Kalmall, "Organic Structures from Spectra", 3rd Ed., John Wiley and Sons, England, 2002.
- [25] R.M. Silverstein and G.C. Bassler, "Spectroscopic Identification of Organic Compounds", 5th Ed., John Wiley and Sons Inc., New York, 127, 1991.
- [26] J.R. Dyer, "Application of Absorption Spectroscopy of Organic Compounds", 8th Ed., Prentice Hall, India, New Delhi, 108, 1991.
- [27] D.V. Pavia and G.M. Lampan, "Introduction to Spectroscopy", 3rd Ed., Thomson Brooks/Cole, Singapore, 143, 2001.
- [28] R.M. Silverstein and G.C. Bassler, "Spectroscopic Identification of Organic Compounds", 5th Ed., John Wiley and Sons Inc., New York, 123, 1991