

ISSN 0974-4169(Print)
0974-4150(Online)

www.ajronline.org



RESEARCH ARTICLE

Microwave Assisted Synthesis, Characterization and Antibacterial Study of Some Novel Schiff's Bases and Azetidinone Compounds derived from Ibuprofen

Hanan A. Al-Hazam¹, Suha K. Al-Mosawi², Zeki A. Naser Al-Shamkhani¹

¹Department of Chemistry, College of Science, University of Basrah, Basrah-Iraq

²Department of Pharmaceutical Chemistry, College of Pharmacy, University of Basrah, Basrah-Iraq

*Corresponding Author E-mail: alshamkhani.zeki74@gmail.com

ABSTRACT:

This work involves synthesis of some new heterocyclic compounds including azetidinone compounds. The new Schiff bases derived from ibuprofen, which was synthesized by microwave irradiation of ibuprofen with hydrazine hydrate in absolute ethanol and this amino compound condensation with different aromatic aldehydes in absolute ethanol. Azetidinone compounds were synthesized by cycloaddition reaction of chloroacetyl chloride to imine group of Schiff bases in dry benzene. M.P., TLC, CHN, UV, FTIR and NMR spectroscopy has characterized all the synthesized compounds. The biological screening data of the synthesized compounds were also studied.

KEYWORDS: Schiff bases, Azetidinone, Antibacterial.

INTRODUCTION:

Ibuprofen was discovered in 1961 by Stewart Adams and initially marketed as Brufen⁽¹⁾ It is available under a number of trade names, including Advil and Motrin⁽²⁻⁴⁾. It was first marketed in 1969 in the United Kingdom and in the United States in 1974.⁽⁵⁻⁷⁾ It is on the World Health Organization's List of Essential Medicines, the most effective and safe medicines needed in a health system.⁽⁸⁾ It is available as a generic medication.⁽⁶⁾ Ibuprofen is a medication in the nonsteroidal anti-inflammatory drug (NSAID) class that is used for treating pain, fever, and inflammation⁽⁹⁾. This includes painful menstrual periods, migraines, and rheumatoid arthritis. It typically begins working within an hour. Ibuprofen is practically insoluble in water, but very soluble in most organic solvents like ethanol (66.18g/100mL at 40 °C for 90% EtOH), methanol, acetone and dichloromethane.

The original synthesis of ibuprofen by the Boots Group started with the compound 2-methylpropylbenzene. The synthesis took six steps. A modern, greener technique for the synthesis involves only three steps .

The chemistry of Schiff base plays a vital role in the progress of chemistry science⁽¹¹⁾, synthesis of Schiff base through classical condensation of aldehydes (or ketone) and imines were pursued⁽¹²⁾ Schiff base are characterized by the N=CH- (imine) group which is important in elucidating the mechanism of transformation in biological systems. Due to great flexibility and diverse structural aspects, wide range of Schiff bases have been synthesized and their complexion behavior was studied⁽¹³⁾. Furthermore, Schiff base are reported to show a variety of interesting biological activities, including antibacterial⁽¹⁴⁾, antifungal⁽¹⁵⁾, anticancer^(16,17) and herbicidal activities⁽¹⁸⁾. The wide range of biological activities exhibited by azetidinone⁽¹⁹⁾ derivatives, the aim of this study is to prepare azetidinone containing mefenamic acid in the molecule and to explore the pharmacological activity of this combination product. Azetidinone is a heterocyclic compound of four-membered unsaturated ring structure composed of three

Received on 03.01.2019

Modified on 05.03.2019

Accepted on 05.04.2019

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Asian J. Research Chem. 2019; 12(2):63-68.

DOI: 10.5958/0974-4150.2019.00014.2