



**RESEARCH ARTICLE**



**A STUDY ON MANNICH BASES SYNTHESIS AND THEIR ANTIBACTERIAL ACTIVITY USING ISOLATED BACTERIAL STRAINS**

**P. SARAVANAN<sup>1</sup> ANDS. ANANDKUMAR<sup>2</sup>**

<sup>1</sup>Assistant Professor in Chemistry, St. Joseph's college of Engineering, Chennai-119, Tamil Nadu, India

<sup>2</sup>Assistant Professor (S.G) in Chemistry, Anna University, Chennai- 25, Tamil Nadu, India

Corresponding Author: [saranpava@gmail.com](mailto:saranpava@gmail.com)

**Abstract**

The synthesis of Mannich bases N-[1-(piprazinobenzyl) acetamide, PBA, N-[1-(piprazinobenzyl) nicodinamide, PBN, N-[1-(piprazinobenzyl)benzamide, PBB, have been reported under microwave radiation. The product is obtained in good yield.

**Keywords:** Microwave, PBA, PBN, PBB, Antibacterial activity.

**Introduction**

In recent times, there has been much interest in the use of microwave radiation in organic synthesis with improved yield and less reaction time (Pidstrom, 2001; Mgilaiah, 2003; Caddick, 1995; . Meenakshi and Ravichandran, 2006). The application of microwave heating under solvent free radiation condition<sup>5</sup> is a promising alternative nonpolluting reaction and has been a current field of interest (Zoupy, 2006). It is well known from the literature that the compounds containing amide moiety have a strong ability to form metal complexes and exhibit a wide range of biological activities (Raman and Ravichandran, 2005; Raman, 2004; Raman and Ravichandran, 2006; Reshetova and Ustynyuk, 2004; Zhao, 2004). Keeping the above facts in mind in this paper, we have described the synthesis of some Mannich bases under microwave radiation.

(10mM), acetamide 0.6g (10mM) and then 1mL of benzaldehyde (10mM) was added and kept under microwave for 2min. As usual workup followed by purification under thin layer chromatography gave the compound, PBA. Yield: 77%., m.p.167<sup>0</sup>C.

**Synthesis of Mannich base, PBN**

Benzaldehyde, piperazine and nicodinamide were taken in 1:1:1 mole ratio. Piperazine 0.9mL (10mM), nicodinamide 1.22g (10mM) and then 1mL of benzaldehyde (10mM) was added and kept under microwave for 2min. As usual workup followed by purification under thin layer chromatography gave the compound, PBN. Yield: 79%., m.p. 169<sup>0</sup>C.

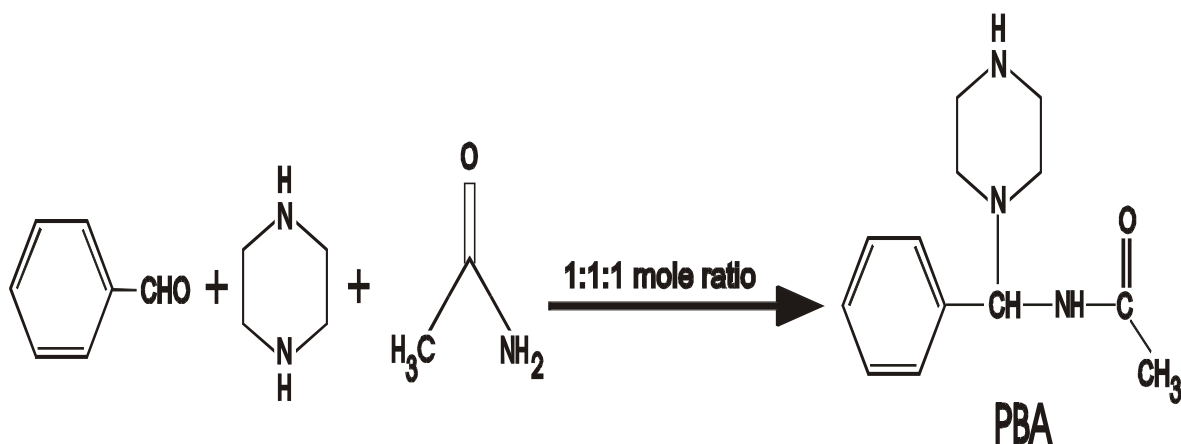
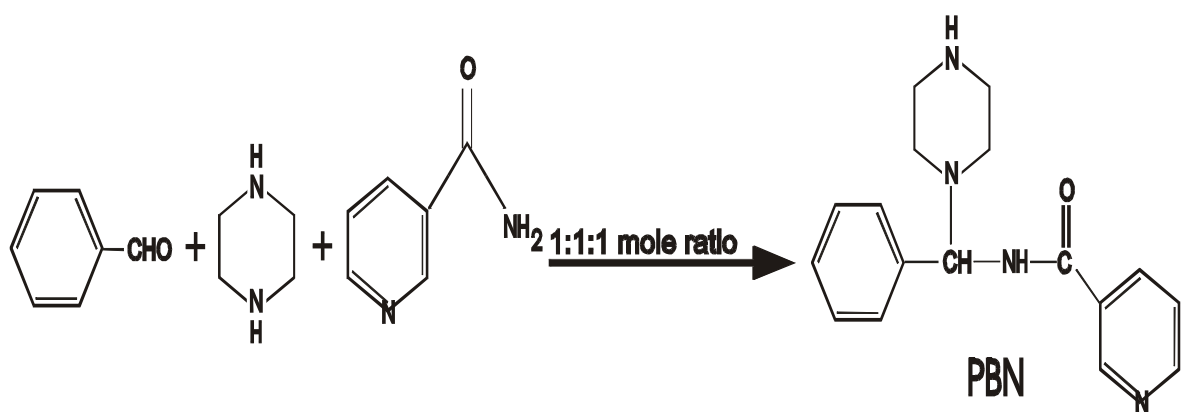
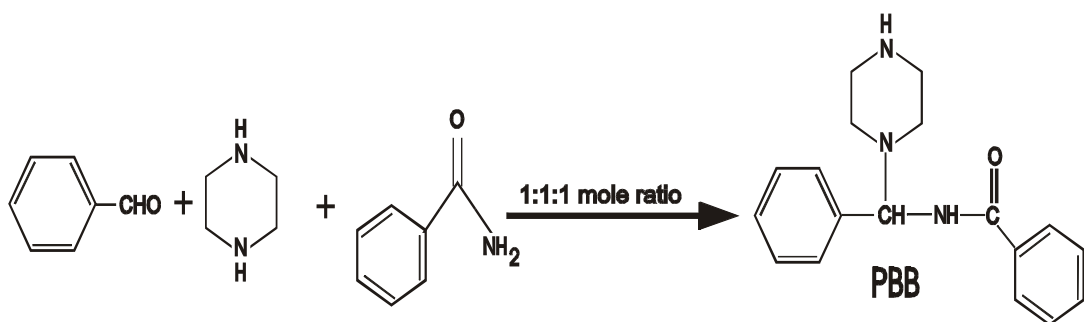
**Synthesis of Mannich base, PBB**

Benzaldehyde, piperazine and benzamide were taken in 1:1:1 mole ratio. Piperazine 0.9mL (10mM), benzamides 1.2g (10mM) and then 1mL of benzaldehyde (10mM) was added and kept under

**Experimental details**

**Synthesis of Mannich base, PBA**

Benzaldehyde, piperazine and acetamide were taken in 1:1:1 mole ratio. Piperazine 0.9mL

**Scheme 1(a):** Formation of Mannich base, PBA**Scheme 1(b):** Formation of Mannich base, PBN**Scheme 1(c):** Formation of Mannich base, PBB

**Table 1.** Analytical data of the Mannich bases

Compound	Found (Calculated)			Mol.wt.	Yield (%)
	C (%)	H (%)	N (%)		
PBA	65.48	7.93 (66.74)(8.15)	18.00 (18.02)	233.16	77
PBN	66.74	6.38 (68.93)(6.75)	18.09 (18.92)	296	79
PBB	73.14	7.04 (73.23) (7.11)	14.98 (14.24)	295	79

**Table 2.** Antibacterial activity of Mannich bases

Compounds	<i>S.aureus</i>	<i>E.coli</i>	<i>P. aeruginosa</i>	<i>B. subtilis</i>
PBA	11	13	12	12
PBN	12	14	11	12
PBB	11	10	12	13
Ampicillin	9	8	8	10

microwave for 3min. As usual workup followed by purification under thin layer chromatography gave the compound, PBB. Yield: 79%, m.p. 167°C. All the compounds (PBA, PBN, and PBB) gave satisfactory spectral data like IR and 1H-NMR.

## Results and discussion

### Analytical data of the Mannich bases

The elemental analyses values were consistent with the stoichiometry for all the Mannich bases and the analytical data are given in the table -1.

### Antibacterial activity of Mannich bases

Antibacterial activity of the compound PBA, PBN, and PBB have been carried out against the gram positive bacteria like *S.aureus*, *B. subtilis* and gram negative DMSO as solvent (Table – 2). Ampicillin was used as the standard for comparing the bacteria such as *E.coli*, *P. auroginosa* using Muller Hinton agar by well-diffusion method using results.

The zone of inhibition values was determined at the end of an incubation period of 24h at 37°C.

### Acknowledgements

The authors thanks the Managing Director, Principal, and Head of the Department of St. Joseph's college of engineering, Sholinganallur for their constant support and encouragement. Second Author is grateful to the Head of the department and board members of Anna University, Chennai for their encouragement. The authors also thank the RSIC and IIT Chennai for the use of their instrumentation facilities.

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