

Study of biological activity of some complexes of Pd(II) and Ni(II) with 1 – Ethyl -phenyltetrazoline – 5 – thione at meta and para positions

Santosh Kumar

(Department of Chemistry/J.N.V. Vaishali, India - 844123)

Date of Submission: 01-10-2020

Date of Acceptance: 19-10-2020

ABSTRACT: Some complexes of Pd(II) and Ni(II) with 1 – ethylphenyltetrazoline – 5 – thione at meta and para positions are taken to know its biological activity. These were tested against bacteria E.coli and S.aureus

Key Words: Ni(II), Pd(II), phenyltetrazoline – 5 – thione (PT5TH), 1-para-ethylphenyltetrazoline – 5 – thione (1-p-EPT5TH), 1-meta-ethylphenyltetrazoline-5-thione (1-m-EPT5TH), MIC (Maximum Inhibition Constant), SM (Streptomycin – Standard drug against bacteria)

I. INTRODUCTION

Complexes of Pd(II) and Ni(II) with 1-ethylphenyltetrazoline – 5-thione¹ are very effective against bacteria E.coli² and S.aureus³. They show strong inhibition against bacteria and this was being supported by MIC values⁴. Complexes of Pd(II) and Ni(II) with 1 – ethylphenyltetrazoline – 5 – thione at meta and para positions show different types of elevated shapes⁵ against different bacteria.

II. EXPERIMENTAL

Following Pd(II) and Ni(II) with 1-ethylphenyltetrazoline – 5-thione at meta and para positions are being used as antibacterial agents⁶ against bacteria E.coli and S.aureus are formed.

1. $[\text{Ni}(1\text{-m-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$
2. $[\text{Ni}(1\text{-p-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$
3. $[\text{Pd}(1\text{-m-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$
4. $[\text{Pd}(1\text{-p-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$

20µL of each of the above mentioned Pd(II) and Ni(II) complexes of 1-ethylphenyltetrazoline – 5-thione at meta and para positions in different discs against bacterial test as antibiotic was taken.

III. Results and Discussion

Complexes of Pd(II) and Ni(II) with 1-ethylphenyltetrazoline-5-thione at meta and para positions were screened against E.coli and S.aureus⁷.

E.coli and S.aureus species are studied at 25ppm, 50ppm, 100ppm and 200ppm respectively for about 96hrs. inhibition⁸. The inhibition zone⁹ formed around each filter paper were measured after inoculation for 96hrs. at room temperature. The result shown in the Table -1.

Table - 1

(Antibacterial Activity)

Complexes	E.coli (%MIC)	E.coli (%MIC)	E.coli (%MIC)	E.coli (%MIC)	S.aures (%MIC)	S.aures (%MIC)	S.aures (%MIC)	S.aures (%MIC)
	At 25ppm	At 50ppm	At 100ppm	At 200ppm	At 25ppm	At 50ppm	At 100ppm	At 200ppm
1. $[\text{Ni}(1\text{-m-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$	0	0	5-10	10-20	0	0	0	0
2. $[\text{Ni}(1\text{-p-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$	0-5	5-10	10-15	15-20	0-5	5-10	10-15	15-20
3. $[\text{Pd}(1\text{-m-EPT5TH})_2\text{Cl}_2] \cdot 2\text{H}_2\text{O}$	0	5-10	10-15	15-20	0	0	10-15	15-20

EPT5TH) ₂ Cl ₂].2H ₂ O								
4. [Pd(1-p-EPT5TH) ₂ Cl ₂].2H ₂ O	5-10	10-15	15-20	20-25	5-10	10-15	15-20	20-25
SM	+++	++++	+++	++++	+++	++++	+++	++++

SM = Streptomycin (Standard Drug); Inhibition in %; (-)0-5%; (+) 5-10% ; (++)10-15%;(+++)+20-25%;(++++)+25-35%.

IV.CONCLUSION

The antibacterial activities⁹ for Pd(II) and Ni(II) complexes with 1-ethylphenyltetrazoline-5-thione at meta and para positions increases with increase in concentration. At higher concentration the activity of complexes of Pd(II) and Ni(II) are very much active against bacteria. Complexes of Pd(II) are more active than the complexes of Ni(II). Para complexes of Pd(II) show activity closer to the activity of the standard drug Streptomycin¹⁰ against the E.coli and S.aureus.

- [10]. ManojRanjan, Santosh Kumar and Abhay Kumar; Napier Indian Advanced Research Journal of Sciences, ISSN-0975-1726, Vol.3, 103-105, Dec. – 2009

REFERENCES

Thesis:

- [1]. Santosh Kumar, Ph.D. Thesis 2009
[2]. Bharati, Ph.D. Thesis, 2013

Journal Papers:

- [3]. ManojRanjan, Santosh Kumar and Abhay Kumar; J.Chemtracks, 11 (2), 491-492, 2009
[4]. ManojRanjan, Santosh Kumar, K.Sharma and Bharati; J.Chemtracks, 11 (2), 561-564, 2009
[5]. ManojRanjan, Santosh Kumar and Abhay Kumar; Ultra Chemistry Vol. 7(1), 145-150 (2011)
[6]. Santosh Kumar and ManojRanjan; IOSR Journal Of Applied Chemistry (IOSR-JAC) E-ISSN: 2278 -5736, Volume 10, Issue 11 Ver. II (November, 2017), PP 51-52
[7]. Manoj Kumar, Santosh Kumar and Abhay Kumar; Ultra Chemistry Vol. 6(3), 370-374 (2010)
[8]. ManojRanjan, Santosh Kumar and Abhay Kumar; Ultra Chemistry Vol. 6(3), 384-386 (2010)
[9]. Abhay Kumar, ManojRanjan and Santosh Kumar; Napier Indian Advanced Research Journal of Sciences, ISSN-0975-1726, Vol. 3, 73-75, Dec. – 2009