ANTIBACTERIAL STUDIES OF THE COMPLEXES OF $S_3N_3Cl_3$ WITH Th $(NO_3)_4.4H_2O$, $ZROCl_2.2H_2O$ AND UO_2 $(CH_3COO)_2.2H_2O$

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The complexes of trithiazyl trichloride ($S_3N_3Cl_3$) with Th $(NO_3)_4.4H_2O$, ZrOCl2.2H2O & UO_2 $(CH_3COO)_{2.2H2O}$ were synthesized .To know the antibacterial behavior of these complexes, filter paper disc method was used. Four types of bacteria namely Staphylococcus albus, staphylococcus aureus, Escherichia coli & Pseudomonas pyocanea were taken for the study of the formed complexes. However no complex showed any antibacterial activity against these bacteria.

INTRODUCTION

Oscar reported that sulphur nitrides can be used to protect seeds from fungi, birds, & other pests [1]. Michel Fiorenza mentioned their use as insecticides [2]. Glemser suggested that some of the sulphur nitrogen fluorine compounds can be used as insecticides or pesticides [3]. Jadon and coworkers reported antibacterial studies of $S_4N_4H_2F_2$, $S_4N_4H_4$, S_7NH, $S_3N_3Cl_3$ and their complexes with metal compounds [4-6]. In this investigation the antibacterial studies of the complexes of $S_3N_3Cl_3$ with Th $(NO_3)_4.4H_2O$, ZrOCl2.2H2O & UO $_2(CH_3COO)_{2.}2H_2O$ were undertaken.

MATERIAL AND METHODS

S_4N_4 (tetra sulphur tetra nitride) was prepared by passing NH_3 (dry) in the solution of S_2Cl_2 dissolved in CCl_4 at 40°C [7]. Trithiazyl trichloride ($S_3N_3Cl_3$) was prepared by the chlorination of S_4N_4 in a nonaqueous solvent [8]. A definite quantity of $S_3N_3Cl_3$ (0.5 gm.) and compounds of the thorium, uranium and zirconium were dissolved in dimethyl formamide (DMF) separately and the solutions were mixed and refluxed for about 24 hours to form complexes [9-10]. The formation of complexes was confirmed by the change in colour of the solution. The products (complexes) thus obtained were separated, washed by suitable solvent, dried over fused $CaCl_2$.

To investigate the antibacterial behaviour of the formed complexes, four types of bacteria namely Staphylococcus albus, Staphylococcus aureus, Escherichia coli and Pseudomonas pyocanea were taken and filter paper disc method was used. Media was prepared by mixing pepton (0.25 gm), beef extract (0.75 gm), yeast extract (0.5 gm), sodium chloride (0.40 gm), glucose (0.30 gm) with 250 ml distilled water in a one litre conical flask & shaken. To dissolve, the mixture was gently warmed and the pH of the solution was adjusted to 7.6. Now 50 ml of this solution was put in a heat resistant Pyrex glass test tubes labeled with each type of bacteria. Each tube was plugged with non absorbent cotton and autoclaved at 100°C for 1 hour. After that the test tubes were cooled to 40°C. The bacteria were put in each tube

according to their labels with the help of platinum wire loop and incubated at 37°C for 24 hours.

For Petri plates, the media prepared was MacConkey agar. To prepare this media, 51.5 g of agar was added in 1000 ml distilled water and boiled to dissolve completely. To sterilize, the solution was autoclaved at 15 lbs pressure and 121°C for 15 minutes.

Petri plates containing MacConkey agar were prepared and each was divided in four equal parts and one hole of 5 mm diameter was made in each part of every plate. 5 mm diameter circular filter paper discs were sterilized. The sterilized discs of filter paper were put into the solution of complexes (prepared by dissolving the complexes in DMF Separately, the concentration of each solution was taken as 5mg/ml) and in DMF. After formation of a thin layer of cultured test organism on the surface of Petri plate media, the solution soaked disc of complexes and DMF were placed in the holes made. These Petri plates were then placed for 24 hours in an incubator at 37°C.

Results and discussion

The complexes were treated against the gram positive (S.albus and S.aureus) and gram negative (E.coli and P.pycocynea) bacteria by invitro method to check their antibacterial behaviour. No inhibition zone was formed for the complexes, indicating that these complexes were ineffective to these bacteria. The inactivity of the complexes was expressed by (–) sign. The table given below show the results obtained-

S. No.	Complexes of $S_3N_3CI_3$ with	(+)ve bacteria		(-)ve bacteria	
		S. albus	S. aureus	E. coli	P. pyocyanea
1.	$Th(NO_3)_4\,4H_2O$	–	–	–	–
2.	$ZrOCl_2\,2H_2O$	–	–	–	–
3.	$UO_2(CH_3COO)_2\,2H_2O$	–	–	–	–

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