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COMPARATIVE STUDY OF CHROMIUM COMPLEXES OF INOSITOL WITH TERTIARY BUTYL CHROMATE(TBC) IN HOT CONDITION

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Abstract : Meso inositol was treated with chromium trioxide in aqueous medium in different molar ratios of oxidants and substrate. In this set of experiment tertiary butyl chromate is treated with meso inositol in different molar ratios in cold condition. When such experiments were done different colours of solid products were obtained which were isolated and characterized by different methods .

.Keywords:

INTRODUCTION

CHROMIUM is regarded as great interest because of its hardness. Chromium is found to be toxic., the most toxic chromium is hexavalent chromium (1v), chromium (1v) is not established as carcinogen when in solution although it may cause allergic contact dermatitis. Although no biological role for chromium has ever been demonstrated, dietary supplements for chromium including Cr (III) picolinate, Cr (III) polynicotinate and related materials. The benefit of those supplements is still under investigation.

The use of chromium containing dietary supplements is controversial owing to the absence of any verified biological role¹⁻⁵, the expense of these supplements and the complex effect of their use. Chromium (1v) oxide is a magnetic compound. Chromium (1v) oxide is used to manufacture tapes used in high performance audiotape and standard cassettes. Chromates can prevent corrosion of steel under wet condition so chromates are added to drilling muds. Chromic acid is a powerful oxidizing agent and is useful in cleaning glassware in laboratory.

Experimental details

A) 1:1.5 ratio

1.8 gram of meso inositol was dissolved in water and heated for half an hour, after that 1.5 gram of chromium trioxide was dissolved in tertiary butyl chromate, then this solution is mixed with aqueous solution of meso inositol and the whole solution is heated for half an hour. When the solid product was obtained it is washed with water and finally with acetone and dried.

EXPERIMENTAL - RESULT AND DISCUSSION:

ELEMENT	PERCENTAGE
C	7.05
H	3.86
O	69.79
Cr	19.36

IR peak peak in the spectrum of WO_3 and its group assignment

541.20 cm^{-1}	2 (M-O)+2 (C-C)
812.40 cm^{-1}	Cr-O bonding
917.90 cm^{-1}	Cr-O bonding
1045.80 cm^{-1}	O-H bonding
1683.80 cm^{-1}	COOH stretching
3380.80 cm^{-1}	-O-H stretching

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The peak at 541.20 cm⁻¹ shows 2(M-O)+2(C-C) bonding at 812.40cm⁻¹ characterize cr-o bonding in the complex .Peak at 917.90 cm⁻¹ show cr-o bonding ,peak at 1045.80 cm⁻¹ shows O-H bonding ,peak at 1683.80cm⁻¹ shows C-O stretching and lastly peak at 3380.80cm⁻¹ shows O-H stretching in the complex.

On the basis of above group assignment the compound may be formulated as C₂H₁₀O₁₂Cr.

B) 1:1 ratio

1:1 ratio i.8 gram of meso inositol was mixed with water and 1 gram of chromium trioxide is treated with 1.5 gram of tertiary butyl alcohol then these two mixture was boiled for two hours .When soild product was fromed it is washed with water and finally with acetone and then dried the compound.

THERMAL ANALYSIS

TEMPRATURE	FORMULATION	% age loss	
25 ⁰ c to 109 ⁰ c	(HOOCH)2Cr.6H ₂ O ↓-2H ₂ O	14.28	13.55
109 ⁰ CTO 126 ⁰ C	(HCOOH).Cr.4H ₂ O ↓-H ₂ O (HCOOH).Cr. 3H ₂ O ↓-HCOOH -H ₂ O	8.33	10.4
126 ⁰ C to 245 ⁰ C	(HCOOH).Cr. 2H ₂ O ↓-2H ₂ O	32.32	33
245 ⁰ C to 310 ⁰ C	HCOOH.Cr	26.86	28.83

RESULT AND DISCUSSION

ELEMENT	PERCENTAGE
C	7.36
H	6.93
O	64.95
Cr	20.76

IR Peaks and its group assignments

732.95 cm ⁻¹	Cr-O bonding
808.17cm ⁻¹	O-H bonding
1369.46cm ⁻¹	-COOH bonding
1581.63 cm ⁻¹	-C-O strecthing
1687.71cm ⁻¹	O-H bonding
3304.06 cm ⁻¹	-O-H strecthing

CONCLUSION

On the basis of thermal analysis it was found that formula of compound is true and it is supported by TGand DTA curve .Since in above reaction it was found that meso inositol is water soluble so the compound formed is not harmful , it is ecofriendiyy so it is also applicable in green chemistry.

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