

THERMAL CHARACTERISATION OF SOME NEW BIS-XANTHINE DERIVATIVES

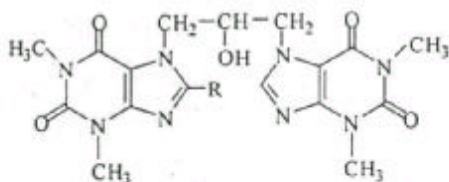
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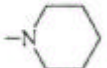

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
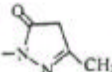
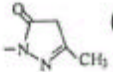
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In our previous papers [1,2] thermal and pharmaceutical characterisation of some new xanthine derivatives has been presented.

In order to enhance and multiply the pharmacological properties of theophylline, the bis-xanthine derivatives, with various substituents in the 8-position have been synthesised. Their chemical structures have been assessed by infrared (IR) and ¹H-NMR spectroscopy and elementary analysis, being:



where R is -H (XXVI); -Br (XXVII); -NO₂ (XXVIII);  (XXIX);  (XXX);

 (XXXI);  (XXXII);  (XXXIII).

This paper deals with thermal behaviour of seven bis-xanthine derivatives followed by thermogravimetry (TG) and differential scanning calorimetry (DSC) and their pharmacological activity.

It has been established that the substituent significantly influences the thermal behaviour of the compounds. Some bis-xanthine derivatives (XXIX, XXXII, XXXIII) melt without decomposition at relatively low temperatures and decompose in two steps, while the others ones melt with decomposition and their thermo-oxidative decomposition takes place in a single step, This step is characterised by an intermediary onset temperature placed between those of theophylline and bis-xanthine but the temperature corresponding to the maximum rate of weight loss is shifted to lower temperature. The weight losses of the all bis-xanthine derivatives are smaller than those of parental components.

Generally by inserting a substituent in the 8-position of the xanthine the thermal stability of the components decrease reported on both to xanthine and theophylline.

The bis-xanthine derivatives have a similar bronchodilator activity with the theophylline but in the same time almost all compounds have superior anti-inflammatory activity comparing by theophylline.

References:

1. Gh. Danila, L. Profire, G.G. Bumbu and C. Vasile, *Thermochimica Acta*, 343 (2000), 69-79.
2. L. Profire, M. Costuleanu, G.G. Bumbu and C. Vasile, *Proceeding of "XV-eme Session des Jumees Medicales Balkaniques"*, 28-30 April, 1999.