

Thermal Behaviour of *Auranofin*

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SUMMARY. The thermal behaviour of *Auranofin*, one of the best established gold containing drugs, has been investigated by thermogravimetric and differential thermal analysis under an oxygen flow. A detailed decomposition mechanism could be postulated. Elemental gold is the final pyrolysis product.

RESUMEN. "Comportamiento térmico de la *Auranofina*". El comportamiento térmico de la *Auranofina*, uno de los fármacos a base de oro mejor conocidos, fue investigado por análisis termogravimétrico y térmico-diferencial, en corriente de oxígeno. Fue posible postular un mecanismo detallado para la descomposición. El producto final de la pirólisis es oro elemental.

INTRODUCTION

The empirical use of gold in medicine can be traced back to the Chinese in 2500 B.C. Modern interest in its medicinal use has arisen since the stimulating work by Robert Koch, who puts gold therapy (*chrysotherapy*) on a solid scientific basis¹⁻³.

In the first decades of this century, gold drugs were used for the treatment of tuberculosis, syphilis and other infectious diseases. Nowadays, gold compounds are almost exclusively used against rheumatoid arthritis and related syndromes³. One of these drugs, (2,3,4,6-tetra-O-acetyl-1-thio- β -D-gluco-pyranosato-S)(triethylphosphine) gold(I) ("*Auranofin*", Figure 1)

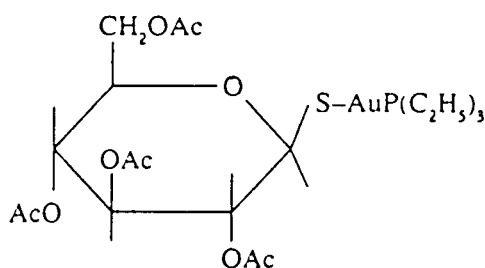


Figure 1. Schematic structure of Auranofin.

KEY WORDS: *Auranofin*, Thermal Behaviour, TG and DTA.

PALABRAS CLAVE: *Auranofina*, Comportamiento Térmico, ATG, ATD.

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is one of the best established compounds in modern medical practice. It can be orally administered and has a potent action in the treatment of rheumatoid arthritis and also presents some antitumor activity¹⁻⁴.

As part of a research program devoted to the characterization of new inorganic drugs, we have recently investigated the spectroscopic behaviour of *Auranofin*⁵. To complement this study, and in order to advance in its complete physicochemical characterization, we have now analyzed the thermal behaviour of the drug using TG and DTA techniques.

EXPERIMENTAL

Auranofin was purchased from ICN-Pharmaceuticals and used as supplied. Its purity was checked through its melting point (mean value of three independent determinations was 112 °C, supporting the presence of the so-called A polymorph. The literature value for the melting point of this polymorph is 110-112 °C⁶.

Thermogravimetric (TG) measurements and differential thermal analysis (DTA) were made with a Shimadzu thermoanalytical system (models TG-50 and DTA-50, respectively), in a flowing O₂ atmosphere (50 ml/min). Experiments