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Preparation of Allylinulin ^{131}I

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Introduction

Inulin is used in physiological experiments, e. g. the study of the renal function and the measurement of the volume of extracellular water.

As inulin is normally determined by colorimetric means, in which case other carbohydrates interfere, the introduction of a radioactive tracer permits better measurements. In 1960 BROOKS et al. [1] introduced an allyl group in the molecule of inulin and then added radioactive iodine to the double linkage thereof with a 48% yield in 24 hours. In 1964 MITTA and CAMIN [2] published a method giving a 70% yield in 1 hour by using radioactive iodine chloride. In 1967 TUBIS et al. [3] prepared allylinulin and propargylinulin and marked it with 131 iodine, introducing certain modifications into the BROOKS' method. We have now prepared allylinulin with a 100% radiochemical yield by means of an easy technique, using a variation of method [2].

Method

In a centrifuge tube provided with a ground glass joint and stopper 5 ml of a solution of allylinulin in water (1mg/ml) is mixed with 0.1 ml of ICl (0.004 M) [4] and 1–10 mCi of ^{131}I (sodium iodide carrier free and without reducer). (The material used by us had been provided by CEN, Saclay.) The p_{II} is adjusted to a value between 6.5 and 8.0 with 0.1 N dilute NaOH. The tube is closed and heated to 55–60 °C during 90 min. Then it is cooled, tested by means of chromatography and passed through a millipore for sterilization. The radiochemical yield of allylinulin ^{131}I is 99–100%.

Discussion

The radiochemical purity of the material was tested by means of paperchromatography, thin layer chromatography [5] and electrophoresis.

We established that the iodination rate was not increased by strong illumination. In runs with p_H-values outside the limits indicated above, yields were much lower.

This was also the case in other runs, where we heated the sample for 60 min instead of 90 min.

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