

The Determination of Copper and Manganese in the Human Liver by Neutron Activation Analysis

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Neutron-activation analysis of copper and manganese was performed both by nondestructive (Cu-66) and chemical separation (Cu-64 and Mn-56) methods and tried to establish the method of choice. Biopsy and autopsy liver samples obtained from 10 cases of Wilson's disease, 5 cases of hemochromatosis and 8 normal cases were studied.

Liver samples (1~100 mg dry weight) were irradiated for 10 min.~4 hrs. using TTR-1 100KW swimming pool reactor with a thermal neutron flux of $3 \times 10^{11} \text{n/cm}^2 \text{sec}$.

In chemical separation method, copper was separated with almost 100% yield by internal electro-deposition technique, and then manganese with 90% yield by usual precipitation method. The separation process for copper was completed within 30 min., and for manganese 60 min.

Comparison between destructive and chemical separation methods for copper analysis showed well correlation in Wilson's autopsy liver specimens stored in formalin. However,

fresh liver specimens obtained by needle biopsy could be analysed only by chemical separation method, because of the presence of plenty amount of sodium.

The hepatic copper content was found to be abnormally increased in Wilson's disease ($88 \sim 720 \mu\text{g/g}$ dry weight) and also in hemochromatosis ($100 \sim 2500 \mu\text{g/g}$). normal range being $2 \sim \mu\text{g/g}$.

The amount of hepatic manganese in hemochromatosis was $4.1 \sim 17 \mu\text{g/g}$ dry weight, showing significant increase compared with normal range of $1.1 \sim 3.4 \mu\text{g/g}$.

In conclusion, activation analysis of trace elements in the human liver proved to be useful tool for medical research and diagnosis. By the combination of rapid chemical separation method with thermal neutron irradiation even the needle biopsy sample (e.g. 1mg) could be successfully analysed. In Wilson's disease increased level of hepatic copper and in hemochromatosis significant increase in both copper and manganese were observed.

Influence of the Spleen on the Clearance of Intravenously Administered Colloid

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In ^{198}Au colloid liver scan, the spleen is visualized in various hepatic diseases, and frequently in liver cirrhosis. Different degrees of liver injuries were produced in rats by injection of carbon-tetrachloride, and several ex-

perimental studies were carried out on these rats to clarify the cause of splenic visualization.

Au colloid clearance rate became lower after splenectomy and more markedly in CCl_4 treat-