

Short Communications

The Synthesis of
Tetraethylthiouram Disulphide
(Antabus) labelled with
Radioactive Sulphur

LORENTZ ELDJARN

Universitetets Fysiologiske Institutt,
Oslo, Norway

Tetraethylthiouram disulphide is at present in frequent use in Scandinavia as an adjuvans in the treatment of alcoholism. A year only has passed since the discovery¹ of its peculiar physiological action on the metabolism of ethyl alcohol, and relatively little is yet known about its turnover and way of action.

In order to investigate its fate in the organism, the compound labelled with radioactive sulphur was synthesized in the following way:

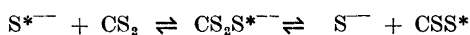
S³⁵ was available as sulphuric acid in 0.25 N hydrochloric acid from Oak Ridge National Laboratory, Oak Ridge, Tennessee.

The labelled sulphate together with carrier sulphate was precipitated as calcium sulphate and reduced at 850° C with carbon monoxide² to calcium sulphide.

The calcium sulphide was transformed to potassium sulphide by liberating the hydrogen sulphide with hydrochloric acid

and receiving it in potassium hydroxide in a diffusion chamber.

The labelled sulphur was brought into carbon disulphide by an exchange reaction³ between labelled potassium sulphide in water and unlabelled carbon disulphide:



When equilibrium is established, the labelled sulphur will be distributed between the two phases according to their sulphur content. In this way, a yield of 50 % per run of radioactive carbon disulphide was easily obtained.

The labelled carbon disulphide was reacted with diethylamine and potassium hydroxide to give potassium diethyl-dithiocarbamate. The oxidation to tetraethylthiouram disulphide was achieved by means of sodium tetrathionate⁴.

The compound was recrystallized from absolute ethyl alcohol to give faintly yellow crystalline needles, m. p. 70.4° C.

1. Hald, J., Jacobsen, E., and Larsen, V. *Acta Pharmacol.* 4 (1948) 285.
2. Zawadzki, J., Kossak, K., and Narbut, H. *Chem Centr.* (1922 III) 329.
3. Edwards, R. R., Nesbitt, F. B., and Solomon, A. K. *J. Am. Chem. Soc.* 70 (1948) 1670.
4. Flemming, W., and Klein, H. German patent, 444 014 (1927).

Received June 29, 1949.