

RAPID AND SENSITIVE MEASUREMENT OF URANIUM IN URINE (WITHIN 15 MINUTES AND DOWN TO 0.010 $\mu\text{g/l}$). METHODS AND RESULTS

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Abstract—A fluorimetric method is outlined for the determination of the uranium concentration in urine in technical report No. 173 of the World Health Organization (1959). By introducing stringent requirements to apparatus and sample preparations, the sensitivity was largely improved so that concentrations down to 0.010 $\mu\text{g/dm}^3$ could be determined with an accuracy of about 30 per cent. These requirements will be discussed. The strict standardization of the sample preparation and the rigorous constancy of the operation of the fluorimeter is required because the slope of the calibration curve $\log i$ vs. $\log c$ (i = indication, c = concentration) is very small in the region below 10 $\mu\text{g/dm}^3$ (0.077, to be compared with 0.41 for $c > 100 \mu\text{g/dm}^3$).

The worth of measuring very sensitively is twofold:

- (a) in the KEMA laboratories much of the work is done with a mixture of UO_2 and ThO_2 in a constant ratio of 15 to 85. The Th-inhalation is much more dangerous and difficult to detect than the U-inhalation. In a number of our cases the most sensitive indication of Th-inhalation is the U-excretion, provided very small quantities of the latter can be measured;
- (b) in many cases the U-excretion appeared to be the most sensitive method to detect incorrect working procedures. Some examples of these will be discussed.