is perhaps the most important factor in the control of the glow phenomenon. It appears that the slow oxidation at 350° C provides insufficient localized heating to overcome the energy barrier associated with the reorganization of the solid structure to the lattice of the α-chromium oxide, whereas the more rapid release of heat at 400° C is sufficient to initiate the crystallization process, which in turn liberates more heat and results in an overall reduction. In accordance with these ideas, the glow phenomenon when it takes place in an oxidizing atmosphere is made up of two stages, which usually overlap giving rise to a large and continuous release of energy. When the secondary oxidation is reduced in extent or in rate, however, the two stages may be separated (Fig. 3).

It is impossible to state the proportion of the chromium oxide system which is converted to the higher oxidation state, but probably the catalytic activity (at least for certain reactions), the black appearance and the semiconductor properties all depend on the presence of two or more oxidation states in a defect structure. Prevention of the glow phenomenon is, therefore, important, not only because it results in crystal growth and loss of specific surface area[3,7] (recent work indicates that the rate of loss of surface area is not especially high at 400° C), but essentially because the overall reduction to α-chromium oxide alters profoundly the electronic properties of the gel.

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Recovery of Iodide-I¹³¹ from Aqueous Solutions of pH 5

I HAVE found an unexpected dependence on the amount of carrier iodide[1,2] of the recovery of radioactive iodide by solvent extraction of its aqueous solutions to which sodium nitrite has been added. The percentage recovery of the radioactive iodide by the solvent is inversely proportional to the amount of iodide in solution if the pH is between 4 and 7. The relationship is linear for the range of concentrations of iodide which were tested, 0·01 μg to 0·1 μg, and the coefficient of variation of experimental results at the mid-point of the range was ±4 per cent.

The procedure used was initiated by the addition of 1·0 ml. of a normal sodium nitrite and 4·0 ml. of sodium acetate and acetic acid buffer, pH 5·0, to an aqueous solution containing 10 μc. of iodide-I¹³¹ and a known amount of iodide as potassium iodide; the final aqueous volume was 14 ml. Solvent extraction was then carried out using 4·0 ml. of benzene and the radioactivity in this extract was compared with that of the initial radioactive iodide solution.

The result is given by this relationship:

$$\frac{\text{reciprocal of percentage}}{\text{recovery of } I^{131}} = S \text{ per cent}^{-1}\ \mu g^{-1}\ (I^-\ \mu g) + K \text{ per cent}^{-1}$$

S, the sensitivity, varies from 0 per cent^{-1} μg^{-1} at pH 4 to 16 per cent^{-1} μg^{-1} at pH 5, while at pH 7, although the sensitivity is high, the recovery was too low for accurate measurement. The value of K at pH 5 is 0·7 per cent^{-1}.

When acetate buffer at pH 5 was used, results identical to those given in experiments conducted at the same pH without buffer were obtained.

The radioactive iodide was shown to act in its intended capacity as a radioactive label. The only effect of an increase in the amount of radioactive iodide was an increase in the blank value, K, in accordance with the known carrier content of the radioactive iodide solution. The change which was observed in the value of the sensitivity, S, from 9 per cent^{-1} μg^{-1} for freshly diluted radioactive solution, to 16 per cent^{-1} μg^{-1} for solution which had been diluted for 21 days, implies the degradation of the radioactive iodide into other species which do not take part in the reaction. The radioactive iodide solution was prepared in 0·02 normal sodium hydroxide by dilution of the commercially supplied solution which contains sodium thiosulphate as a stabilizing agent.

The function of the benzene was shown to be that of an extracting solvent and not that of an active reagent[3]. Other solvents were tried, but absorption on glassware decreased the linearity and accuracy of the results. Reproducible results could only be obtained by a strict control of the time sequence of operations. It was also necessary to wash the glassware with "chromic acid" and to follow this with a thorough rinsing with distilled water. The interference of chloride was found to be negligible in one experiment, in which 40 mg of chloride, as sodium chloride, was added to each of the iodide solutions.

I suggest that the basic mechanism of the procedure is the oxidation of iodide by nitrite to elemental iodine. The inverse relationship between the recovery of radioactive iodide and the amount of iodide implies that an isotopic dilution effect occurs and that a constant amount of iodine is extracted. The sensitivity of the procedure and the linearity of the results suggest the possibility of developing an analytical method for the determination of sub-microgram quantities of iodine.

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Electronic Absorption Bands associated with the Hydrogen Bondings of Thymine and Uracil

IN the course of investigations of the electronic absorption spectra of crystals of DNA bases, we have found that an unusual band appears in addition to the usual $\pi \rightarrow \pi^*$ transition when the crystal has the
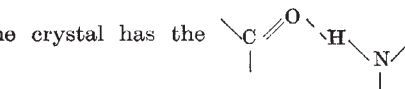
hydrogen bonding. This absorption band is observed in thymine monohydrate, thymine, uracil and 5-ethyl 6-methyl uracil crystals; however, it is not found in calcium thymidylate and barium uridylate[1]. In the former class of crystals, hydrogen bondings of the type