and measurement of their absorption at 510 mμ.[7] A mixture of undialyzed enzyme and acetolactic acid produced 1.3 μmoles of α-ketoisovaleric acid, and the yield was almost doubled by TPN addition. Crude extract or substrate alone, or dialyzed extract with substrate yielded only negligible amounts. Addition of boiled crude extract, TPN, or DPN and ATP restored activity of the dialyzed extract.

These data demonstrate that acetolactate is a precursor of valine in *S. cerevisiae*, and suggest that TPN (probably TPNH) is involved with this transformation. Further efforts are proceeding for purification and fractionation of this enzyme system and for identification of several other keto acids which appeared in the chromatograms.[9]

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THE INSTITUTE FOR CANCER RESEARCH AND
LANKENAU HOSPITAL RESEARCH INSTITUTE
PHILADELPHIA, PENNSYLVANIA
MURRAY STRASSMAN
JENNIE B. SHATTON
MILTON E. CORSEY
SIDNEY WEINHOUSE

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THE EFFECT OF OXYGEN ON FERRIC ION YIELDS IN AQUEOUS SOLUTIONS CONTAINING POLONIUM

Sir:

A revised $G(\text{Fe}^{+++})$ yield of 5.2 ± 0.15 has been obtained for α-particles from dissolved Po^{210} in the aerated Fricke ferrous sulfate dosimeter. The previous value of about 6.0 reported by various workers[1,2,3] is probably too high. Other lower values[4,5,6] have been reported recently. $G(\text{Fe}^{+++})$ has been found to vary from 3.7 ± 0.2 in air-free solutions to values approaching 10 at oxygen concentrations above 0.1 *M*.

Solutions studied were 3 m*M* in FeSO_4, 1 m*M* in NaCl, 0.8 *N* in H_2SO_4 and contained on the average 0.4 mc./ml. of Po^{210}. $G(\text{Fe}^{+++})$ was independent of dose rate between 0.01 and 0.90 mc./ml. Oxygen pressures below 1 atmosphere were obtained by evacuating the samples and reintroducing known partial pressures of oxygen. Oxygen, at a known pressure, was introduced into a stainless steel bomb containing cells with polonium solutions for high pressure studies. Oxygen concentrations were calculated from the data of Zoss, Suciu and Sibbitt.[7] Suitable corrections were made for the dark reaction and oxidation at atmospheric pressures. The change in ferric ion concentration was followed spectrophotometrically and the rate of energy absorption in the solutions was obtained from the rate of Po^{210} disintegration. This rate was measured by absolute counting in a calibrated pulse ionization chamber. The full energy of the 5.3 Mev. alpha particle was assumed to have been expended within the solution.

$G(\text{Fe}^{+++})$ increases rapidly from its air-free value of 3.7 to 5.2 for air-saturated solutions (2.2×10^{-4} *M* O_2). Above oxygen concentrations of 10^{-3} *M*, however, $G(\text{Fe}^{+++})$ is nearly a linear function of the logarithm of the oxygen concentration. The highest experimental $G(\text{Fe}^{+++})$ value obtained in this work was 9.1 ± 0.4 at 1905 p.s.i. oxygen.

The increase in $G(\text{Fe}^{+++})$ with oxygen concentration is attributed to a competition of reaction (1) with reactions (2), (3), and (4) in the mechanism of the Fricke ferrous sulfate dosimeter.[5]

$$\text{H} + \text{O}_2 = \text{HO}_2 \tag{1}$$

$$\text{H} + \text{H} = \text{H}_2 \tag{2}$$

$$\text{H} + \text{OH} = \text{H}_2\text{O} \tag{3}$$

$$\text{H} + \text{H}^+ + \text{Fe}^{++} = \text{H}_2 + \text{Fe}^{+++} \tag{4}$$

Work with higher than 3 m*M* initial ferrous ion concentration $[(\text{Fe}^{++})_0]$ indicates a marked dependence of $G(\text{Fe}^{+++})$ on $(\text{Fe}^{++})_0$ for oxygen concentrations in the regions of 10^{-2} to 10^{-1} *M*. In contrast, at atmospheric pressures the ferric ion yield is much less sensitive to $(\text{Fe}^{++})_0$. Further work is being carried out on the effect of ferrous ion concentration and on the effect of pressures above 2000 p.s.i.

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CHEMISTRY DEPARTMENT
UNIVERSITY OF ROCHESTER
ROCHESTER 20, N. Y.
CONRAD N. TRUMBORE

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