

effect in concentrated solutions appears to be due to masking by unchanged material.

Fig. 3 shows the time course for one of our tested substances, adenylic acid. Exposure to ultraviolet light for 4 hr results in approximately 20% reduction in absorption at 260 m $\mu$ , whereas for 6 hr the reduction is approximately 40%. After 12 hr exposure, the selective absorption spectrum disappears. Uric acid, which has two peaks, one at 235 m $\mu$  and the other at 290 m $\mu$ , also behaves as do all the other nucleic acid derivatives. Complete obliteration of its absorption curve is observed in Fig. 4.

The curves showing the effect on the other substances studied are omitted for lack of space. It suffices to say that in all cases the curves are essentially similar and reproducible.

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## Contact Potentials of Evaporated Iron Films in Air and in Nitrogen at Low Pressure

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Curves showing the variation of contact potential with time for metal surfaces prepared by the evaporation process have been obtained *in vacuo* at room temperature using the method of Zisman (1). A platinum plate is used as the standard of reference.

The change in potential of an iron surface amounts to several tenths of a volt and is due largely to the sorption of oxygen. The rate is pressure-sensitive between 0.01 and 10  $\mu$ , being very low and very high, respectively. The curves at 0.1  $\mu$  are characterized by a sharp rise, followed by a rounded peak, which falls to a level about 0.3 v below the maximum.

From between 0.01  $\mu$  and 0.1  $\mu$  to the higher pressures, the potential change is reversible upon alternating the pressure from high to low values. The trend of the variations indicates that irreversible sorption is continually taking place, also, and at a rate that is more or less dependent on the average pressure. The desorption rate is lower than the sorption rate.

When pure, dry nitrogen is introduced into the vacuum chamber, no appreciable change in surface potential with

time is observed, and pulsing of the pressure does not produce corresponding alternation in potential. This is assumed to indicate that most of the observed change is caused by oxygen.

Electrical resistance variations of similar evaporated films in the same vacuum range show that gross penetration of the oxygen and its combination with the iron are negligibly slow in comparison with the surface sorption effects, because the resistance increases at a negligible rate at pressures of 0.1  $\mu$ , whereas the surface potential curve reaches its maximum within a minute. A slight reduction in resistance of the iron films occurs within a few seconds after they are deposited and may be due to atomic rearrangement or to a drop in temperature.

Exposure to pressures of 10–100  $\mu$  resulted in slow and probably incomplete resistance changes, which are not reversible with reduction in pressure. At atmospheric pressure and humidity, evaporated iron layers up to 30 Å in thickness show little change in resistance after 30 min, but the resistance gradually increases over a period of hours at a rate depending on the thickness of the film.

In connection with these studies, experiments have been conducted in which evaporated metal films were produced within an electron microscope column. Electron diffraction patterns of these films were observed continuously from the time of deposition. It was possible to follow the formation of an oxide pattern over that of the metal as a function of time and pressure. For example, the first perceptible change at a pressure of 27  $\mu$  requires 1 1/2 min for iron, whereas 27 min were required for nickel.

Studies of the type described for iron have been made on a number of other metals, with results which vary considerably from metal to metal. Details will shortly be available.

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## Improved Technique for Weighing Tissues with the Cartesian Diver

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In the course of experiments on respiration of embryonic chick hearts using the Cartesian diver technique, it became necessary to weigh the hearts. Ordinary methods with the analytic balance proved impractical. Zeuthen (1) describes a method for weighing tissues and cells in the Cartesian diver and presents equation (1) for calculation of weights:

$$RW_x = RW_{st} \left( \frac{1 - \frac{B}{B - p_x}}{1 - \frac{B}{B - p_{st}}} \right) \quad (1)$$

In this equation  $RW_x$  is the buoyed weight of the tissue,  $RW_{st}$  the buoyed weight of the standard,  $B$  is atmos-