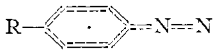
These predictions have been experimentally borne out recently by Hey and co-workers[28] and others. These workers have studied the homolytic reactivity of various benzene derivatives to attack by phenyl radicals and have found that, in fact, as predicted the reactivity postulated by Wheland and others is valid.[29] This work on the relative energies of the intermediates in homolytic aromatic substitutions is consistent with the half-wave values of the postulated intermediates, XI, obtained in the polarography of diazonium salts.



XI

A much more complete description of the reductions postulated in equation (a)[30] must await further intensive efforts to determine the reversibility or to eliminate the possibility of rate-controlled limiting currents[31] in the first polarographic waves. A study of the slope $i(i_d - i)$ is at present inconclusive.[32] Perhaps a more definitive test would be made by the method of oscillographic polarography. At this point we can only emphasize the necessarily qualitative nature of our arguments. Quantitative correlations between substituent effects and some polarographic property cannot be too enthusiastically pursued, especially in cases where the mechanism of the electrode process is not definitely known.

CAMBRIDGE, MASS.

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(28) D. H. Hey and G. H. Williams, *Disc. Faraday Soc.*, **14**, 216 (1953); D. H. Hey, R. R. Augood and G. H. Williams, *J. Chem. Soc.*, 2094 (1952), 3412 (1953); R. L. Dannley and M. Sternfeld, THIS JOURNAL, **76**, 4543 (1954) and earlier papers.

(29) The relevance of these experiments may be in doubt in view of recent discoveries regarding radical complexes in solution. See C. E. Boozer and G. S. Hammond, THIS JOURNAL, **76**, 3861 (1954).

(30) We have not completely eliminated the possibility of equation (b) being the process for the first wave. The rationale for the stabilization of the various radicals may apply equally well to the substituted phenyl radicals. See S. G. Cohen and C. H. Wang, THIS JOURNAL, **75**, 5594 (1953).

(31) P. Delahay, *ibid.*, **73**, 4944 (1951).

(32) I. M. Kolthoff and J. J. Lingane, "Polarography," Vol. I, Interscience Publishers, New York, N. Y., 1952.

NOTES

The Vapor Pressure of Polonium

BY LEROY S. BROOKS[1]

RECEIVED FEBRUARY 11, 1955

The vapor pressures of polonium between 0.3 and 90 mm. with corresponding temperatures of 438° and 745° have been measured by the method[2] employed to measure the vapor pressure of two other sixth-group elements, selenium and tellurium.

Experimental

Sample Preparation.—Polonium was vacuum-distilled seven times, reduced in a dry hydrogen atmosphere, and distilled into a quartz sample tube. The sample tube was attached to the vapor pressure apparatus which was outgassed for 48 hours at 780° while it was being evacuated to a pressure of 10^{-6} mm. The sample tube was opened to the vacuum system, the accumulated helium from the alpha decay was pumped off, and the polonium was volatilized into the sample bulb of the vapor pressure apparatus.

Pressure Measurement.—The temperature of the sickle gage was maintained at 770° during all of the measurements. During each set of measurements, the null position of the gage, which had a sensitivity of 0.03 mm. pressure per scale division deflection of the gage pointer, changed an amount equivalent to about 1 mm. The null position for each vapor pressure measurement was recorded as though the gage had drifted uniformly with time.

Temperature Measurement.—At the time of each pressure measurement, temperature measurements of the sample bulb containing the polonium and a copper block around the sample bulb revealed a temperature difference due to the energy from the decay of the polonium. This difference was about 6° at 400°, 4° at 580° and 2° at 740°. This difference decreased as the temperature increased because some of the polonium volatilized from the sample bulb to the gage.

Results

The least-squares representation of nine measurements of vapor pressures between 438 and 745° is

$$\log p = \frac{-5377.8 \pm 6.7}{T} + 7.2345 \pm 0.0068$$

when p is the pressure in mm., T is the absolute temperature, and the probable errors are as stated. These measurements were taken the first two days. Due to the decay products of the polonium or an impurity, measurements on the fourth, fifth, sixth and eighth days gave a lower vapor pressure curve each day.

From the above equation, the calculated boiling point is 962.04 ± 1.93°C. and the latent heat of vaporization is 24.597 ± 0.031 kcal./mole.

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(1) Ford Motor Company, Ford Scientific Laboratory, Dearborn, Michigan.

(2) L. S. Brooks, THIS JOURNAL, **74**, 227 (1952).

(3) Mound Laboratory is operated by Monsanto Chemical Company for the United States Atomic Energy Commission under Contract Number AT-33-1-GEN-53.

Iodine Solutions of Unexpected Color

BY ERVIN COLTON

RECEIVED JANUARY 26, 1955

It is well known that iodine in "non-active" solvents yields *violet* solutions[1] with an absorption maximum in the proximity of 520 mμ. In these solvents the iodine dissolves without reaction. Table I lists the absorption for iodine in three "non-active" solvents.

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(1) J. Kleinberg and A. W. Davidson, *Chem. Revs.*, **42**, 601 (1948).