

## THE VAPOR PRESSURE OF SOLID CARBONIC ACID.

BY H. DU BOIS.

IN 1899 I published with A. P. Wills some preliminary measurements relative to the thermometric and cryogenic applications of solid carbonic acid.<sup>1</sup> The object was to establish some approximate data with reference to practical applications of solid carbonic acid in the laboratory, and in no wise to attempt an exact final determination of the temperature-pressure function. On account of the return of Professor Wills to America, the proposed more accurate determinations referred to in the last part of the original article were not made.

Recently there have appeared two articles relative to this subject, one by J. Zeleny and R. H. Smith, and one by J. and A. Zeleny.<sup>2</sup> The  $P\theta$ -curve found lies about one degree higher than ours, and this is displaced toward the axis of pressure; instead of the value 5.5 cm. Hg. per degree for  $dP/d\theta$  at atmospheric pressure found by us, the first of the above mentioned articles gives the value 6.35, and the latter the value 5.87, *i. e.*, 1 cm. Hg. corresponds to a temperature change of  $.17^\circ$ .

In accordance with the above introductory remarks it is quite possible that such a difference might exist; also it is well known that the graphical determination of the slope of a curve with only a few given points is much more uncertain than the inverse graphical integration.

In a final determination of the constants it seems to me that the employment of pure carbonic acid is absolutely necessary, but the physicists mentioned above used the material as it is to be bought, as did likewise we ourselves. Our material was obtained through the burning of coke, and 99.5 per cent. at least was carbonic acid although there might have been traces of air, water and grease.

In America, as I am informed by reliable authorities, liquid carbonic acid is very frequently obtained from brewery gases and is not in general so pure as that obtained here, since it frequently unavoidably contains odoriferous material and the like, associated with the brewing process. It is scarcely possible to judge without further information whether, or in how far, such circumstances are adequate to account for the differences referred to above.

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<sup>1</sup> H. du Bois und A. P. Wills, Verh. D. Phys. Ges., I., 168, 1899.

<sup>2</sup> J. Zeleny and R. H. Smith, Phys. Zeitschr., 7, 667, 1906; J. und A. Zeleny, l. c., p. 716; PHYS. REV., 23, 308, 1906.