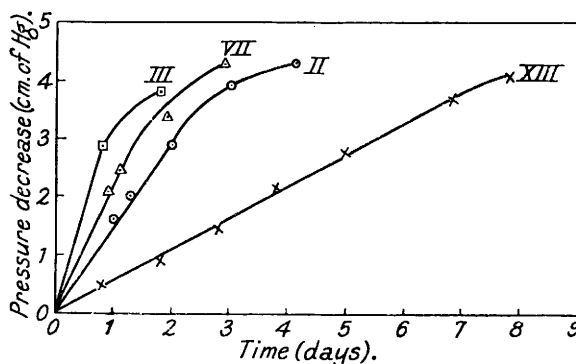


158. *Surface Reaction between Acetylene and Iodine.*

By CECIL P. ELLIS.

ACCORDING to Berthelot (*Ann. Chim. Phys.*, 1866, **9**, 428), iodine and acetylene do not combine at the ordinary temperature even in direct sunlight. This is not correct. If iodine is sublimed on to the sides of a flask, which is then filled with acetylene and kept for two or three days at 25°, most of the iodine crystals are converted into colourless elastic needles of acetylene di-iodide, m. p. 73°, b. p. 192° (corr.).



The rate of the reaction depends to some extent on the nature of the surface used, but not to so marked a degree as in the reaction between ethylene and iodine (see Mooney and Reid, J., 1931, 2597). The rate of reaction is decreased by a film of paraffin wax on the sides of the flask, but is accelerated by a film of alcohol. It is significant that the usual method of preparation of the di-iodide consists in passing acetylene over iodine moistened with alcohol (Sabanejeff, *Annalen*, 1875, **178**, 109). The speed of the reaction is slightly greater with sublimed than with powdered iodine.

A 500-c.c. glass flask was used. Before each experiment the flask was immersed in chromic acid, washed, and dried in a current of hot air. The paraffin-wax surface was obtained as described by Mooney and Reid (*loc. cit.*).

The iodine was weighed and introduced into the flask. The air in the flask was then displaced by acetylene, purified by passage through a solution of copper sulphate containing sulphuric acid and dried over anhydrous calcium chloride. The flask was connected to a mercury manometer, and was completely immersed in a large tank of water. As the temperature in this country varies very little, this arrangement sufficed to keep the temperature of the flask constant within 1° or 2°.

Typical results are given below, and are illustrated in the accompanying figure. In each case 1 g. of iodine was used, and the surface area was 300 cm.²; dp/dt gives the rate of change of pressure (in cm. of Hg) with time (in days).

Expt. No.	Iodine surface.	Other surface.	dp/dt .
XIII	Powder	Paraffin	0.55
II	"	Glass	1.4
VII	Sublimed	"	2.1
III	Powder	Alcohol	3.6

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