TABLE 1

EFFECT OF PRESSURE ON THE METHANOLYSIS OF ETHYL CHLORIDE IN PURE METHANOL AT 65 °C

Pressure, p (atm)	Reaction Time (sec)	Percentage Reaction*	First-Order Rate Constant $10^8\,k$ (sec^{-1})	$\frac{k_p}{k_1}$†
1	57600‡	‡‡	4·7	1
3000	90000	3	37	7·9
10000	21600	6	290	62
12500	20700	11	510	109
15000	14400	9	630	134
17500	12600	14	1000	210
20000	10800	16	1560	330
23200	3600	8	2300	490
25100	5400	13	2600	550
27500	1800	6	3400	720
30600	1800	10	5700	1210

* Measured as hydrochloric acid.

† This is the ratio of the rate constant at the pressure p to that at 1 atm.

‡ These two columns list typical results, not all the experimental data.

Firstly, the pressure vessel A (Fig. 2) was given external support in the manner devised by Bridgman (1936). It was made in the form of a cone, of very acute angle, fitting closely into a similar conical hole in a steel supporting ring B. The thrust of the piston C not only produced the internal pressure in A

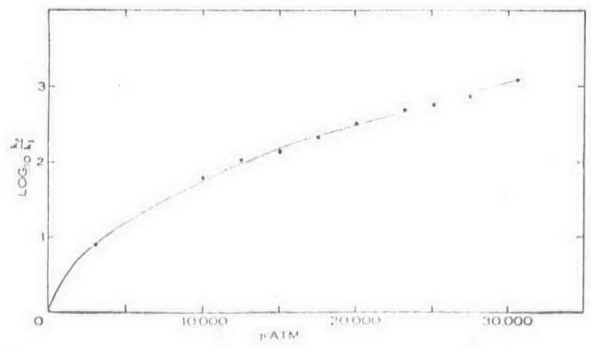

Fig. 1.—The pressure-dependence of the rate of methanolysis of ethyl chloride.

but also forced this vessel into the supporting ring and produced a pressure at its outer surface equal to half the internal pressure.

Secondly, since the limit of the crushing strength of steel is about 25000 atm, it was necessary to make the piston of "Carboloy"* which has a crushing

* "Carboloy" is the trade name for tungsten carbide cemented in cobalt. The grade used was No. 883.