LITERATURE CITED

(1) *Am. Petrol. Inst., Research Project* 44, "Selected Values of Properties of Hydrocarbons and Related Compounds," Carnegie Press, Pittsburgh, 1953.
(2) Few, A.V., Smith, J.W., *J. Chem. Soc.* 1949, p. 753.
(3) Frey, P.R., Gilbert, E.C., *J. Am. Chem. Soc.* 59, 1344 (1937).
(4) Prengle, H.W., Jr., Worley, F.L., Jr., Mauk, C.E., J. CHEM. ENG. DATA 6, 395 (1961).
(5) Scatchard, G., Benedict, M.A., *J. Am. Chem. Soc.* 58, 837 (1936).
(6) Weissberger, A., "Technique of Organic Chemistry, Organic Solvents," Volume VII, 2nd ed., Interscience, New York (1955).

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Vapor Pressure of Fluoroalcohols

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The vapor pressures of the following fluoroalcohols were measured in the range of temperatures between 0° C. and room temperature: 2,2,2-trifluoroethanol (T.F.E.); 2,2,3,3,3-pentafluoropropanol (P.F.P.); 2,2,3,3,4,4,4-heptafluorobutanol (H.F.B.).

IN CONNECTION with a study of solvents for polymers, the vapor pressures of three fluoroalcohols were measured: 2,2,2-trifluoroethanol (T.F.E.); 2,2,3,3,3-pentafluoropropanol (P.F.P.); 2,2,3,3,4,4,4-heptafluorobutanol (H.F.B.). The purity of each sample was determined from the presence of only a single significant peak in the vapor phase chromatogram. Alcohol P.F.P. was purified to this standard by preparative scale vapor phase chromatography.

A small sample of the alcohol (1 to 2 cc.) was placed in a tube connected to a mercury manometer (*1*) and to a vacuum system. After degassing the specimen by several successive freezing and thawing cycles under vacuum, the vapor pressures were measured over the range of temperatures between 0° C. and room temperature. Pressures were measured by means of a cathetometer capable of being read to ±0.005 cm. Temperatures were

Table II. Values of A and B and the Probable Error of Estimate of log P

Fluoroalcohol	A	B	Probable Error of Estimate of log P
2,2,2-Trifluoroethanol	9.651	2325	2.92×10^{-3}
2,2,3,3,3-Pentafluoropropanol	9.921	2459	2.10×10^{-3}
2,2,3,3,4,4,4-Heptafluorobutanol	9.173	2277	5.74×10^{-3}

measured by a calibrated platinum resistance thermometer and were accurate to ±0.05°.

RESULTS

Table I shows the vapor pressures of each alcohol as a function of temperature determined from two samples freshly distilled into the system. The best straight line through the points of a plot of log (pressure) *vs.* reciprocal temperature was computed by the method of least squares, the data being fitted to an equation of the form:

$$\log P = A - B/T$$

where P = vapor pressure in millimeters, and A and B are constants. T is absolute temperature. Table II shows the calculated values of A and B together with the probable error of estimate of a calculated log P.

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LITERATURE CITED

(1) Dodd, R.E., Robinson, P.L., "Experimental Inorganic Chemistry," p. 340, Elsevier, New York, 1957.

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Table I. Vapor Pressures of Fluoroalcohols

2,2,2-Trifluoro-ethanol		2,2,3,3,3-Penta-fluoropropanol		2,2,3,3,4,4,4-Hepta-fluorobutanol	
Temperature, °C.	Vapor pressure, mm.	Temperature, °C.	Vapor pressure, mm.	Temperature, °C.	Vapor pressure, mm.
−0.40	13.55	0.15	8.31	0.00	6.73
0.30	13.80	3.00	10.45	5.10	9.75
2.25	16.05	3.70	10.80	7.15	11.40
4.10	18.55	5.40	12.40	9.35	12.90
5.85	21.00	5.80	12.70	9.80	13.10
7.55	23.55	7.60	14.55	11.00	14.75
8.75	25.60	8.70	15.75	13.20	17.30
9.30	26.50	9.70	17.00	15.20	18.80
11.10	29.90	11.40	19.10	15.35	19.55
12.40	32.85	12.70	20.90	16.90	21.25
15.00	38.65	14.90	24.30	18.40	23.25
16.80	43.15	15.20	24.60	19.90	24.15
19.80	52.05	17.50	28.85	21.40	27.40
20.60	54.40	18.25	30.45	23.90	31.90
23.10	63.35	20.10	34.15	24.80	34.15
25.40	72.50	20.65	35.55		
		22.40	39.30		
		23.05	41.00		