TABLE IV. *Summary of data used in the computations.*

LIQUID	PRESSURE IN kg/cm²	$(\partial E/\partial V)T$ IN kg/cm²	E_{vap} kg/cm	FREE VOLUME IN cc/mole	OBSERVED VISCOSITY IN MILLIPOISES
n-Pentane at 30°C	1	1,640	238,800	1.21	2.20
	1,000	2,420	269,600	0.32	4.54
	2,000	2,310	283,050	.151	7.35
	3,000	2,110	291,010	.097	
	4,000	1,480	296,950	.068	15.5
	5,000	150	298,630	.053	
	6,000	−620	298,120	.044	28.5
	7,000	−1,240	296,520	.036	
	8,000	−1,090	294,850	.029	50.4
	9,000	−910	293,650	.023	
	10,000	−1,150	292,650	.020	90.7
Diethyl Ether at 52.5°C	1	2,190	227,500	1.52	1.83
	1,000				
	2,000	2,400	272,800	.128	5.46
	4,000	1,860	286,200	.071	10.50
	6,000	970	291,800	.048	17.58
	8,000	120	293,200	.034	27.75
	10,000	1,370	291,900	.028	42.69
	12,000	−2,050*	290,400	.023	64.24
Water at 0°C	1	−162	435,500	0.439	17.92
	1,000	+518	435,540	.292	16.50
	2,000	775	436,000	.204	17.15
	3,000	845	436,730	.149	18.35
	4,000	673	437,800	.114	19.91
	5,000	−112	438,900	.096	21.83
Mercury at 0°C	1	12,675	599,800	0.0119	
	2,000	12,186	601,100	.0114	
	4,000	12,355	602,100	.0109	
	6,000	12,928	602,900	.0105	

* At 11,000.

(e.g., water and alcohols), the method of computation employed here yields interesting information about the structure and the mechanism of viscous flow in such liquids.

In our calculation of viscosities we have treated the flow of individual molecules only and have neglected the fact that aggregates of molecules can flow as units also. More precisely to the calculated fluidity for the single mechanism we should add the fluidity due to the double, triple and higher multiple molecule mechanisms. That our approximation ordinarily neglects factors considerably smaller than two in the fluidity may be seen by comparing the theoretical or experimental fluidity of molecules with values for molecules twice as large but otherwise similar. This aspect of the subject will be developed in detail at a later time.

APPENDIX

Since the data used in making the computations are of some interest for their own sake, they are assembled in Table IV. The data for benzene and for iso-pentane have not been done in enough detail and are over too short a pressure range to justify their inclusion in this Table. The free volumes have been computed from sound velocities, and the thermodynamic data are from the data given by Bridgman.[8]

An X-Ray Study of Acetylsalicylic Acid When Incorporated in Certain Sugars

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INTRODUCTION

CONFLICTING claims have recently been advanced regarding the possibility of incorporating acetylsalicylic acid—aspirin—into certain sugar bases as a solid solution. The original claims made regarding the existence of such a solid solution[1] have been subsequently denied[2] as a result of certain x-ray experiments. In these latter experiments only x-ray diffraction patterns consisting of a series of sharp lines—characteristic of a mixture of powdered crystalline fragments—are reported. Unpublished preliminary x-ray studies of this problem made in the summer of 1935 yielded a diffraction pattern for the sugar bases consisting of a single, broad diffuse ring—characteristic of an amorphous or glass-like material. Since the types of x-ray patterns obtained differ so sharply it has seemed worth while to examine once more the whole problem from an x-ray point of view.

PREPARATION OF SAMPLES

Sucrose and glucose were mixed with sufficient additional water to assure a complete solution of

[1] E. C. Merrill, Chem. Abs. **31**, 5949 (1937).
[2] S. S. Sidhu, J. App. Phys. **9**, 546 (1938).