with dilute sodium carbonate solution, dilute sodium bisulfite solution and water. It was then dried by azeotropic distillation with 100 ml. of benzene. Further distillation yielded 144 g. (88%) of 4-phenyl-*m*-dioxane, b. p. 121–123° at 11 mm.

In several repetitions of the preceding preparation, the yields varied from 84 to 88%. The combined products were fractionated through a Vigreux column. A center cut from this distillation had these physical properties: b. p. 95° at 2 mm., n^{25}_D 1.5288, d^{25} 1.101. Prins[1] reported b. p. 128–30° at 13 mm., n^{18}_D 1.53063, d^{18}_4 1.1111.

ORGANIC CHEMISTRY DEPARTMENT
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The Vapor Pressures of Solutions of Sodium and Potassium Bisulfates at 25°

BY R. H. STOKES

As part of a general study of the vapor pressure–concentration curves of a number of mono-sodium and mono-potassium salts of dibasic acids which is in progress in this Laboratory, isopiestic vapor pressure measurements have been made on sodium and potassium bisulfates. Owing to the relatively large second dissociation constant[1] of sulfuric acid (K_2 = 0.012 at 25°) these two salts have little in common with the others being investigated and are therefore reported separately.

Stock solutions of the two bisulfates were prepared by dissolving the calculated amount of the anhydrous normal sulfate in sulfuric acid which was previously analyzed by weight-titration against sodium carbonate. The resulting solutions were equilibrated (in platinum dishes) against sodium chloride as reference substance by the usual technique,[2] the molalities of pairs of solutions of equal vapor pressure being given in Table I. From these results and the standard values[3] for sodium chloride the vapor pressures at round concentrations were computed and are given in Table II in the form of $(p_0 - p)/mp_0$. A graph of this relative molal vapor pressure lowering against *m* shows a rapid rise below 1*M* as is to be expected in consequence of the increasing dissociation of the bisulfate ion with dilution. There seems, however, to be little justification for attempting a quantitative estimate of the amounts of the various ionic species present. The calculation of activity coefficients is also complicated by this dissociation which makes extrapolation to infinite dilution difficult. Consequently, though the data are of good accuracy (0.1–0.2%) no solute activity data derived from them are included in Table II.

TABLE I

(a) Isopiestic solutions of sodium bisulfate and sodium chloride at 25°

m_{NaHSO_4}	0.1041	0.1237	0.1482	0.1529	0.2039	
m_{NaCl}	0.1190	0.1400	0.1664	0.1713	0.2255	
m_{NaHSO_4}	0.2823	0.4272	0.6425	0.7774	1.084	1.174
m_{NaCl}	0.3078	0.4573	0.6763	0.8119	1.119	1.210
m_{NaHSO_4}	1.340	1.382	1.632	2.398	3.065	4.067
m_{NaCl}	1.376	1.420	1.671	2.456	3.138	4.140
m_{NaHSO_4}	4.191	5.112	5.240	5.610	6.320	
m_{NaCl}	4.265	5.122	5.228	5.555	6.147	

(b) Isopiestic solutions of potassium bisulfate and sodium chloride at 25°

m_{KHSO_4}	0.1068	0.1277	0.1361	0.1445	0.2423	0.4216
m_{NaCl}	0.1199	0.1425	0.1505	0.1595	0.2584	0.4311
m_{KHSO_4}	0.5287	0.7233	0.7538	1.002	1.156	1.502
m_{NaCl}	0.5300	0.7038	0.7307	0.9471	1.074	1.359
m_{KHSO_4}	1.664	1.827	2.259	2.653		
m_{NaCl}	1.485	1.614	1.943	2.235		

TABLE II

RELATIVE MOLAL VAPOR PRESSURE LOWERINGS $(p_0 - p)/mp_0$ OF SODIUM AND POTASSIUM BISULFATES AT 25° (CALCULATED RELATIVE TO p_1 = 23.756 MM.)

m	$NaHSO_4$	$KHSO_4$	*m*	$NaHSO_4$	$KHSO_4$
0.1	0.03838	0.03775	1.2	0.03425	0.03074
.125	.03778	.03722	1.4	.03435	.03035
.15	.03737	.03669	1.6	.03456	.03000
.2	.03671	.03589	1.8	.03482	.02977
.3	.03590	.03469	2.0	.03508	.02957
.4	.03537	.03384	2.5	.03582	.02916
.5	.03502	.03316	3.0	.03658	
.6	.03477	.03266	3.5	.03731	
.7	.03460	.03223	4.0	.03795	
.8	.03445	.03188	4.5	.03847	
.9	.03436	.03156	5.0	.03882	
1.0	.03432	.03129	6.0	.03912	

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[1] W. J. Hamer, THIS JOURNAL, **56**, 860 (1934).

[2] R. A. Robinson and D. A. Sinclair, *ibid.*, **56**, 1830 (1934).

[3] R. A. Robinson, *Trans. Roy. Soc. New Zealand*, **75** (II), 203 (1946); see also appendix to R. H. Stokes and B. J. Levien, THIS JOURNAL, **68**, 333 (1946).

Quinazolines. IV. Synthesis and Hydrolysis of 3-(4′-Quinazoyl)-4-quinazolone[1]

BY ARTHUR J. TOMISEK AND BERT E. CHRISTENSEN

In the attempts to prepare 4-cyanoquinazoline by fusion of 4-chloroquinazoline with either silver or cuprous cyanide[2] only small amounts of a fibrous material were isolated. This product appeared to be pure, and analysis suggested that it might be a diquinazolyl ether. Since 4-chloroquinazoline is easily hydrolyzed by traces of water, it is possible to account for diquinazolyl ether as resulting from the condensation of the 4-chloroquinazoline with small amounts of hydroxyquinazoline impurity.

There is no record in the literature of a diquinazolyl ether. Bogert and May attempted the syn-

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[1] Published with the approval of the Monographs Publication Committee, Oregon State College, as Research Paper No. 115, School of Science.

[2] Tomisek and Christensen, THIS JOURNAL, **67**, 2114 (1945).