

<p>COMPONENTS:</p> <p>1. Potassium pyrosulfite; $K_2S_2O_5$; [16731-55-8]</p> <p>2. Water; H_2O; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Foerster, F.; Brosche, A.; Norberg-Schutz, Chr.</p> <p><i>Z. Phys. Chem.</i> <u>1924</u>, 10, 435-96.</p>																																																																																				
<p>VARIABLES:</p> <p>Temperature: 267 - 367 K</p>	<p>PREPARED BY:</p> <p>Mary R. Masson</p>																																																																																				
<p>EXPERIMENTAL VALUES:</p> <p><u>Composition of equilibrium solutions</u></p> <table border="1" data-bbox="111 524 672 1266"> <thead> <tr> <th>t/°C</th> <th>$K_2S_2O_5$ mass %</th> <th>$K_2S_2O_5^a$ mol/kg</th> </tr> </thead> <tbody> <tr><td>- 6.0</td><td>19.30</td><td>1.076</td></tr> <tr><td>- 6.0</td><td>19.25</td><td>1.072</td></tr> <tr><td>- 5.6</td><td>19.75</td><td>1.107</td></tr> <tr><td>- 5.5</td><td>19.52^b</td><td>1.091</td></tr> <tr><td>- 3.1</td><td>20.52</td><td>1.161</td></tr> <tr><td>- 3.0</td><td>20.65^b</td><td>1.171</td></tr> <tr><td>0.0</td><td>22.20</td><td>1.283</td></tr> <tr><td>+ 0.2</td><td>22.21</td><td>1.284</td></tr> <tr><td>0.2</td><td>22.14</td><td>1.279</td></tr> <tr><td>10.0</td><td>26.50</td><td>1.622</td></tr> <tr><td>18.9</td><td>30.53</td><td>1.977</td></tr> <tr><td>22.0</td><td>31.82</td><td>2.099</td></tr> <tr><td>28.5</td><td>34.61</td><td>2.381</td></tr> <tr><td>33.7</td><td>36.46</td><td>2.581</td></tr> <tr><td>41.0</td><td>39.35</td><td>2.918</td></tr> <tr><td>46.2</td><td>41.39</td><td>3.176</td></tr> <tr><td>46.4</td><td>41.60</td><td>3.204</td></tr> <tr><td>50.2</td><td>42.79</td><td>3.364</td></tr> <tr><td>60.1</td><td>46.11</td><td>3.849</td></tr> <tr><td>60.5</td><td>46.65</td><td>3.933</td></tr> <tr><td>60.7</td><td>46.15</td><td>3.855</td></tr> <tr><td>70.2</td><td>49.27</td><td>4.369</td></tr> <tr><td>72.0</td><td>49.64</td><td>4.434</td></tr> <tr><td>82.8</td><td>52.42</td><td>4.956</td></tr> <tr><td>90.4</td><td>53.70</td><td>5.217</td></tr> <tr><td>93.6</td><td>55.50</td><td>5.610</td></tr> <tr><td>94.0</td><td>55.51</td><td>5.612</td></tr> </tbody> </table> <p style="text-align: right;">Solid phase: $K_2S_2O_5$</p> <p style="text-align: right;">(continued on next page)</p>		t/°C	$K_2S_2O_5$ mass %	$K_2S_2O_5^a$ mol/kg	- 6.0	19.30	1.076	- 6.0	19.25	1.072	- 5.6	19.75	1.107	- 5.5	19.52 ^b	1.091	- 3.1	20.52	1.161	- 3.0	20.65 ^b	1.171	0.0	22.20	1.283	+ 0.2	22.21	1.284	0.2	22.14	1.279	10.0	26.50	1.622	18.9	30.53	1.977	22.0	31.82	2.099	28.5	34.61	2.381	33.7	36.46	2.581	41.0	39.35	2.918	46.2	41.39	3.176	46.4	41.60	3.204	50.2	42.79	3.364	60.1	46.11	3.849	60.5	46.65	3.933	60.7	46.15	3.855	70.2	49.27	4.369	72.0	49.64	4.434	82.8	52.42	4.956	90.4	53.70	5.217	93.6	55.50	5.610	94.0	55.51	5.612
t/°C	$K_2S_2O_5$ mass %	$K_2S_2O_5^a$ mol/kg																																																																																			
- 6.0	19.30	1.076																																																																																			
- 6.0	19.25	1.072																																																																																			
- 5.6	19.75	1.107																																																																																			
- 5.5	19.52 ^b	1.091																																																																																			
- 3.1	20.52	1.161																																																																																			
- 3.0	20.65 ^b	1.171																																																																																			
0.0	22.20	1.283																																																																																			
+ 0.2	22.21	1.284																																																																																			
0.2	22.14	1.279																																																																																			
10.0	26.50	1.622																																																																																			
18.9	30.53	1.977																																																																																			
22.0	31.82	2.099																																																																																			
28.5	34.61	2.381																																																																																			
33.7	36.46	2.581																																																																																			
41.0	39.35	2.918																																																																																			
46.2	41.39	3.176																																																																																			
46.4	41.60	3.204																																																																																			
50.2	42.79	3.364																																																																																			
60.1	46.11	3.849																																																																																			
60.5	46.65	3.933																																																																																			
60.7	46.15	3.855																																																																																			
70.2	49.27	4.369																																																																																			
72.0	49.64	4.434																																																																																			
82.8	52.42	4.956																																																																																			
90.4	53.70	5.217																																																																																			
93.6	55.50	5.610																																																																																			
94.0	55.51	5.612																																																																																			
<p>AUXILIARY INFORMATION</p>																																																																																					
<p>METHOD/APPARATUS/PROCEDURE:</p> <p>Solids were equilibrated with solution under a hydrogen atmosphere, in a vessel maintained in a thermostat. Samples for analysis were withdrawn through a tube plugged with cotton wool.</p> <p>Samples were reacted with excess of standard iodine solution, then the excess was back-titrated with thiosulfate.</p> <p>A Beckman apparatus (1) was used for the determination of freezing points.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p>Prepared by saturating a concentrated solution of potassium hydroxide or potassium carbonate with sulfur dioxide, and allowing the salt to crystallize.</p> <p>ESTIMATED ERROR:</p> <p>Temperature: ± 0.1 K Analyses: no estimate possible.</p> <p>REFERENCES:</p> <p>1. Ostwald, W.; Luther, R. <i>Hand-und Hilfsbuch zur Ausfuhrung physicochemischer Messungen</i> 5th Ed., Akademische Verlag., Leipzig, <u>1931</u>.</p>																																																																																				

COMPONENTS:			ORIGINAL MEASUREMENTS:
1. Potassium pyrosulfite; $K_2S_2O_5$; [16731-55-8]			Foerster, F.; Brosche, A.;
2. Water; H_2O ; [7732-18-5]			Norberg-Schutz, Chr.
Z. Phys. Chem. <u>1924</u> 10, 435-96.			
EXPERIMENTAL VALUES (continued):			
t/°C	$K_2S_2O_5$ mass %	$K_2S_2O_5^a$ mol/kg	
- 0.4	21.50*	1.232	
+ 1.0	22.75	1.325	
1.2	22.50	1.306	
1.8	22.85	1.332	
4.0	24.15	1.432	
5.0	23.75	1.401	
6.1	25.10	1.507	
7.7	26.10	1.589	
8.9	26.75	1.643	Solid phase: $K_2S_2O_5 \cdot 2/3H_2O$
10.1	27.25	1.685	
11.6	28.30	1.775	
12.2	28.37 ^b	1.782	
15.0	30.05	1.932	
16.4	30.95	2.016	
18.0	31.30	2.049	
20.1	33.20	2.236	
- 1.07	3.73	0.174	
- 1.93	6.75	0.326	
- 3.73	13.15	0.681	Solid phase: ice
- 4.87	17.19	0.934	
- 5.63	19.47	1.087	$K_2S_2O_5$ dissolved
- 1.94	6.95	0.336	
- 2.93	10.50	0.528	
- 3.93	13.90	0.726	
- 1.34	4.64	0.219	
- 2.39	8.41	0.413	Solid phase: ice
- 3.48	12.32	0.632	
- 5.50	19.20	1.069	$K_2S_2O_5 \cdot 2/3H_2O$ dissolved
^a Molalities calculated by the compiler.			
^b Results considered particularly reliable by the authors.			

COMPONENTS:		ORIGINAL MEASUREMENTS:			
1. Potassium hydrogen sulfite; KHSO_3 ; [7773-08-4] 2. Water; H_2O ; [7732-18-5]		Platt, J.H.; Hudson, D. <i>J. Soc. Dyers Colourists</i> <u>1926</u> , 42, 348-9.			
VARIABLES:		PREPARED BY:			
Temperature: 287 - 373 K		Mary R. Masson			
EXPERIMENTAL VALUES:					
	KHSO_3^a	KHSO_3^b	KHSO_3^c	$\text{K}_2\text{S}_2\text{O}_5^b$	
t/°C	g/100 g of water	mass %	mol/kg	mass %	
100	115.3	53.55	9.594	49.54	
90	109.0	52.15	9.069	48.24	
83	107.0	51.69	8.904	47.82	
73	89.39	47.20	7.439	43.66	
69	85.01	45.95	7.074	42.51	
60	76.57	43.37	6.373	40.12	
50	66.67	40.00	5.548	37.00	
40	62.86	38.60	5.231	35.71	
31	54.67	35.35	4.550	32.70	
20	49.00	32.89	4.078	30.43	
14	44.72	30.90	3.721	28.58	
a Original data. b Calculated by the compiler. c Molalities calculated by the compiler.					
AUXILIARY INFORMATION					
METHOD APPARATUS/PROCEDURE:			SOURCE AND PURITY OF MATERIALS:		
The hydrogen sulfite was dissolved in distilled water. The solution, with excess of solid, was slowly heated to 100°C, and stirred there for 15 min. After settling for 15 min, about 1 g of solution was withdrawn, weighed, and analysed by reaction with excess of iodine and back-titration with thiosulfate. The solution was allowed to cool about 10°C, kept at constant temperature for about 15 min, then another sample was removed. This was repeated. Sampling was difficult at temperatures above 75°C, owing to the rapid crystallization.			The hydrogen sulfite used was recrystallized from commercial potassium metabisulfite. The crystals were washed and well drained on the filter (reduced pressure) but were not dried (to prevent oxidation to sulfate).		
			ESTIMATED ERROR:		
			No estimates possible. Replicates said to be "in close agreement".		
			REFERENCES:		