

COMPONENTS:		ORIGINAL MEASUREMENTS:		
1. Ammonium pyrosulfite; $(\text{NH}_4)_2\text{S}_2\text{O}_5$; [32736-64-4]		Vasilenko, N.A.		
2. Ammonium sulfate; $(\text{NH}_4)_2\text{SO}_4$; [7783-20-2]		Zh. Priklad. Khim. 1948, 21, 917-26.		
3. Water; H_2O ; [7732-18-5]				
EXPERIMENTAL VALUES (continued):				
$(\text{NH}_4)_2\text{SO}_4$	NH_4HSO_3	$(\text{NH}_4)_2\text{SO}_4^a$	$\text{NH}_4\text{HSO}_3^a$	Solid ^b
mass %	mass %	mol/kg	mol/kg	phase
<u>Temperature = -19°C</u>				
39.25	0.0	5.563	0.	A + C
32.5	10.2	4.884	1.796	C
24.5	22.7	3.995	4.338	C
17.7	35.9	3.285	7.807	C
12.4	48.7	2.745	12.632	C
9.7	54.6	2.339	15.431	C
8.8	57.2	2.229	16.975	C
8.8	57.1	2.222	16.895	B + C
7.2	58.9	1.829	17.531	B
6.0	60.0	1.519	17.806	B
3.8	62.1	0.960	18.375	B
2.8	63.6	0.718	19.099	B
0.0	65.5	0.	19.156	B
0.0	44.5	0.	8.090	A
1.0	43.1	0.154	7.779	A
8.4	33.0	1.234	5.682	A
16.3	25.1	2.395	4.322	A
30.0	10.5	4.341	1.781	A
<u>Temperature = -10°C</u>				
40.0	0.0	5.740	0.	C
33.5	10.0	5.105	1.786	C
25.5	22.4	4.214	4.338	C
18.5	35.5	3.463	7.787	C
12.5	49.1	2.803	12.901	C
9.9	55.4	2.457	16.109	C
9.0	58.1	2.355	17.818	C
8.4	59.2	2.232	18.436	C
8.0	60.8	2.208	19.662	B + C
7.6	61.8	2.139	20.377	B
6.3	62.5	1.739	20.212	B
2.9	66.3	0.811	21.719	B
0.0	68.7	0.	22.146	B
13.5	13.1	1.584	1.801	A
28.0	0.0	3.348	0.	A
0.0	26.0	0.	3.545	A
<u>Temperature = 0°C</u>				
41.0	0.	5.983	0.	C
34.5	9.9	5.343	1.797	C
26.5	22.1	4.439	4.338	C
19.5	35.1	3.698	7.801	C
12.8	50.3	2.987	13.754	C
10.0	56.3	2.555	16.856	C
9.1	59.1	2.464	18.752	C
8.9	58.8	2.372	18.368	C
7.9	64.2	2.438	23.217	C
7.4	65.3	2.334	24.134	B + C
6.6	65.6	2.044	23.809	B
3.0	69.3	0.933	25.243	B
2.0	70.6	0.628	25.998	B
0.	72.0	0.	25.945	B

(continued on next page)

COMPONENTS:

1. Ammonium pyrosulfite; $(\text{NH}_4)_2\text{S}_2\text{O}_5$; [32736-64-4]
2. Ammonium sulfate; $(\text{NH}_4)_2\text{SO}_4$; [7783-20-2]
3. Water; H_2O ; [7732-18-5]

ORIGINAL MEASUREMENTS:

Vasilenko, N.A.

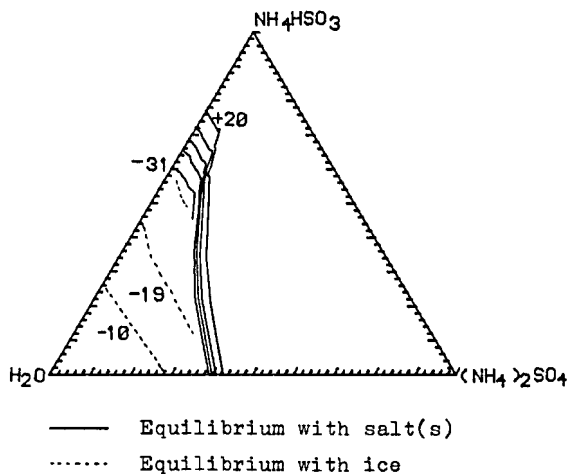
Zh. Priklad. Khim. 1948, 21, 917-26.

EXPERIMENTAL VALUES (continued):

$(\text{NH}_4)_2\text{SO}_4$ mass %	NH_4HSO_3 mass %	$(\text{NH}_4)_2\text{SO}_4^a$ mol/kg	$\text{NH}_4\text{HSO}_3^a$ mol/kg	Solid ^b phase
<u>Temperature = 20°C</u>				
36.5	9.6	5.831	1.797	C
29.0	21.3	5.024	4.324	C
21.5	34.2	4.179	7.789	C
13.3	52.0	3.300	15.120	C
5.9	71.2	2.218	31.371	C
6.9	68.6	2.425	28.251	C
7.3	66.8	2.427	26.023	C
8.0	65.5	2.599	24.939	C
9.4	60.7	2.707	20.483	C
9.9	58.1	2.664	18.319	C
10.3	58.1	2.807	18.551	C
42.8	0.	6.443	0.	C
6.0	71.8	2.327	32.633	B + C
0.	77.0	0.	33.779	B

^a Molalities calculated by the compiler.

^b Solid phases: A - ice, B - $(\text{NH}_4)_2\text{S}_2\text{O}_5$, C - $(\text{NH}_4)_2\text{SO}_4$



COMPONENTS: 1. Ammonium hydrogen sulfite; NH_4HSO_3 ; [10192-30-0] 2. Ammonium sulfate; $(\text{NH}_4)_2\text{SO}_4$; [7783-20-2] 3. Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Terres, E.; Heinsen, A. <i>Das Gas- und Wasserfach</i> <u>1927</u> , 70, 1157-61.																																																																	
VARIABLES: Concentrations of the components Four temperatures: 273 - 333 K	PREPARED BY: Mary R. Masson																																																																	
EXPERIMENTAL VALUES: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">$(\text{NH}_4)_2\text{SO}_4$ mass %</th> <th style="text-align: center;">NH_4HSO_3 mass %</th> <th style="text-align: center;">$(\text{NH}_4)_2\text{SO}_4^a$ mol/kg</th> <th style="text-align: center;">$\text{NH}_4\text{HSO}_3^a$ mol/kg</th> <th style="text-align: center;">Solid^b phase</th> </tr> </thead> <tbody> <tr> <td colspan="5" style="text-align: left;"><u>Temperature = 0°C</u></td> </tr> <tr><td>42.8</td><td>0.0</td><td>5.663</td><td>0.</td><td>A</td></tr> <tr><td>37.95</td><td>7.30</td><td>5.246</td><td>1.345</td><td>A</td></tr> <tr><td>29.80</td><td>19.62</td><td>4.459</td><td>3.914</td><td>A</td></tr> <tr><td>22.22</td><td>30.95</td><td>3.591</td><td>6.668</td><td>A</td></tr> <tr><td>14.84</td><td>45.67</td><td>2.844</td><td>11.669</td><td>A</td></tr> <tr><td>7.71</td><td>62.40</td><td>1.952</td><td>21.064</td><td>A</td></tr> <tr><td>5.85</td><td>66.92</td><td>1.626</td><td>24.797</td><td>A</td></tr> <tr><td>4.04</td><td>69.85</td><td>1.171</td><td>26.992</td><td>B</td></tr> <tr><td>3.39</td><td>70.33</td><td>0.976</td><td>27.002</td><td>B</td></tr> <tr><td>2.02</td><td>71.07</td><td>0.568</td><td>26.647</td><td>B</td></tr> <tr><td>0.0</td><td>71.8</td><td>0.</td><td>25.690</td><td>B</td></tr> </tbody> </table> <p style="text-align: center;">(continued on next page)</p>		$(\text{NH}_4)_2\text{SO}_4$ mass %	NH_4HSO_3 mass %	$(\text{NH}_4)_2\text{SO}_4^a$ mol/kg	$\text{NH}_4\text{HSO}_3^a$ mol/kg	Solid ^b phase	<u>Temperature = 0°C</u>					42.8	0.0	5.663	0.	A	37.95	7.30	5.246	1.345	A	29.80	19.62	4.459	3.914	A	22.22	30.95	3.591	6.668	A	14.84	45.67	2.844	11.669	A	7.71	62.40	1.952	21.064	A	5.85	66.92	1.626	24.797	A	4.04	69.85	1.171	26.992	B	3.39	70.33	0.976	27.002	B	2.02	71.07	0.568	26.647	B	0.0	71.8	0.	25.690	B
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METHOD APPARATUS/PROCEDURE: To the saturated solution of one salt was added various amounts of the other. After equilibrium was reached, ammonia was determined by the Kjeldahl method, sulfite by titrimetry, and sulfate gravimetrically. <div style="text-align: center; margin-top: 20px;"> </div>	SOURCE AND PURITY OF MATERIALS: ESTIMATED ERROR: Temperature: 0.1 K Analyses: no estimate possible. REFERENCES:																																																																	

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EXPERIMENTAL VALUES (continued):

$(\text{NH}_4)_2\text{SO}_4$ mass %	NH_4HSO_3 mass %	$(\text{NH}_4)_2\text{SO}_4^a$ mol/kg	$\text{NH}_4\text{HSO}_3^a$ mol/kg	Solid ^b phase
<u>Temperature = 20°C</u>				
44.5	0.0	6.068	0.	A
43.0	2.68	5.991	0.498	A
38.96	8.18	5.578	1.561	A
26.93	26.78	4.403	5.837	A
21.25	36.25	3.784	8.606	A
16.66	44.91	3.281	11.791	A
11.58	56.50	2.745	17.859	A
8.86	65.11	2.576	25.238	A
7.31	69.08	2.343	29.522	A
7.21	69.65	2.358	30.370	A
6.39	72.11	2.249	33.841	A
6.33	72.75	2.290	35.088	A
5.81	72.87	2.062	34.486	A
4.29	74.57	1.536	35.591	B
3.46	75.22	1.228	35.598	B
0.0	76.95	0.	33.684	B
<u>Temperature = 40°C</u>				
47.17	0.0	6.757	0.	A
42.68	6.47	6.352	1.284	A
32.38	22.43	5.423	5.008	A
21.69	40.24	4.312	10.665	A
14.02	57.52	3.693	20.106	A
11.98	63.00	3.624	25.406	A
9.54	70.42	3.603	35.445	A
8.27	74.34	3.599	43.133	A
7.72	75.73	3.530	46.169	A
7.55	76.09	3.492	46.927	A
6.35	77.28	2.936	47.632	B
6.09	77.72	2.847	48.436	B
4.91	78.29	2.212	47.020	B
2.72	79.43	1.153	44.898	B
0.0	80.62	0.	41.973	B
<u>Temperature = 60°C</u>				
48.4	0.0	7.098	0.	A
34.92	20.21	5.890	4.545	A
23.93	38.71	4.847	10.454	A
16.27	54.45	4.205	18.763	A
11.55	68.7	4.426	35.097	A
8.66	77.21	4.638	55.133	A
7.90	79.82	4.868	65.584	A
7.70	80.79	5.063	70.821	A
6.71	81.79	4.416	71.760	B
6.04	81.38	3.633	65.271	B
4.93	82.30	2.922	65.027	B
0.0	84.70	0.	55.857	B

^a Molalities calculated by the compiler.

^b Solid phases: A - ammonium sulfate, B - ammonium hydrogen sulfate