

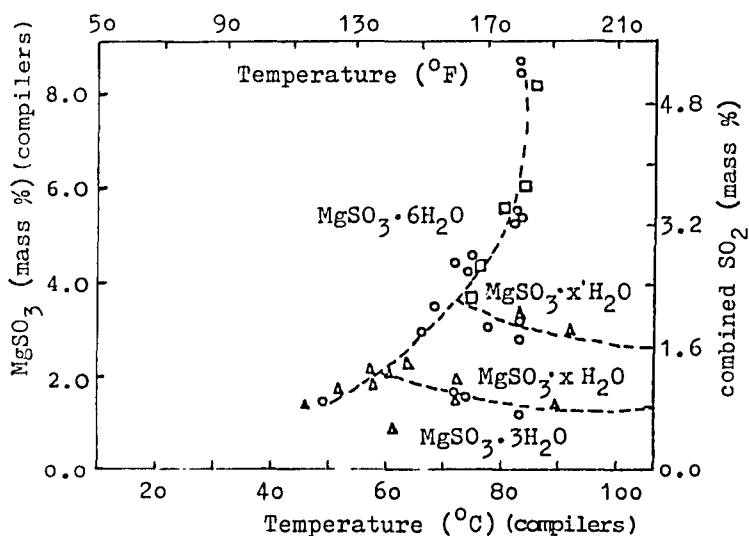
COMPONENTS: 1. Magnesium sulfite; MgSO_3 ; [7757-88-2] 2. Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Marusawa, T. <i>Kogyo Kagaku Zasshi</i> <u>1917</u> , 20, 280-7.
VARIABLES: Temperature: 291 K	PREPARED BY: B. Engelen
EXPERIMENTAL VALUES: <p>The author reports the solubility of $\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$ [13446-29-2] in water at 18°C to be</p> $c(\text{MgSO}_3) = 0.0501 \text{ mol dm}^{-3} \text{ (5.229 g/dm}^3, \text{ compiler).}$	
AUXILIARY INFORMATION	
METHOD APPARATUS/PROCEDURE: Saturation method. Equilibrium was established after several days. SO_3^{2-} was determined iodometrically.	SOURCE AND PURITY OF MATERIALS: $\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$ was precipitated from oxygen-free MgCl_2 solutions with Na_2SO_3 . The precipitate was checked for Cl^- and SO_4^{2-} content.
ESTIMATED ERROR: The value given is the mean of 4 experiments which differ by 1.8%.	
REFERENCES.	

COMPONENTS: 1. Magnesium sulfite; MgSO_3 ; [7757-88-2] 2. Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Hagusawa, H. <i>Sci. Rep. Tohoku Imp. Univ., Ser. I 1934, 23, 182-92; Bull. Inst. Phys. Chem. Res., Tokyo 1933, 12, 976-83.</i>																																																																				
VARIABLES: Temperature: 273 - 368 K	PREPARED BY: B. Engelen, H.D. Lutz																																																																				
EXPERIMENTAL VALUES: The solubilities of $\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$ [13446-29-2] and $\text{MgSO}_3 \cdot 3\text{H}_2\text{O}$ [19086-20-5] in water at various temperatures are: <table border="1" data-bbox="111 580 669 1195"> <thead> <tr> <th rowspan="2">t/°C</th> <th colspan="2">MgSO_3</th> </tr> <tr> <th>mass %^a</th> <th>m/mol kg^{-1b}</th> </tr> </thead> <tbody> <tr> <td></td> <td colspan="2">$\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$</td> </tr> <tr> <td>0</td> <td>0.338</td> <td>0.0324</td> </tr> <tr> <td>15</td> <td>0.497</td> <td>0.0478</td> </tr> <tr> <td>25</td> <td>0.646</td> <td>0.0622</td> </tr> <tr> <td>35</td> <td>0.846</td> <td>0.0817</td> </tr> <tr> <td>45</td> <td>1.116</td> <td>0.1081</td> </tr> <tr> <td>55</td> <td>1.465</td> <td>0.1424</td> </tr> <tr> <td>57.5</td> <td>1.688</td> <td>0.1645</td> </tr> <tr> <td>62.5</td> <td>1.950</td> <td>0.1905</td> </tr> <tr> <td></td> <td colspan="2">$\text{MgSO}_3 \cdot 3\text{H}_2\text{O}$</td> </tr> <tr> <td>38</td> <td>1.034</td> <td>0.1001</td> </tr> <tr> <td>42</td> <td>0.937</td> <td>0.0906</td> </tr> <tr> <td>46</td> <td>0.897</td> <td>0.0867</td> </tr> <tr> <td>50</td> <td>0.844</td> <td>0.0815</td> </tr> <tr> <td>55</td> <td>0.817</td> <td>0.0789</td> </tr> <tr> <td>60</td> <td>0.758</td> <td>0.0731</td> </tr> <tr> <td>62.5</td> <td>0.748</td> <td>0.0722</td> </tr> <tr> <td>65</td> <td>0.720</td> <td>0.0694</td> </tr> <tr> <td>75</td> <td>0.664</td> <td>0.0640</td> </tr> <tr> <td>85</td> <td>0.623</td> <td>0.0600</td> </tr> <tr> <td>95</td> <td>0.615</td> <td>0.0592</td> </tr> </tbody> </table> <div data-bbox="651 614 1162 1068"> </div> <p data-bbox="692 1139 1008 1195"> ^a g/100 ml soln. author ^b Calculated by compilers </p>		t/°C	MgSO_3		mass % ^a	m/mol kg ^{-1b}		$\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$		0	0.338	0.0324	15	0.497	0.0478	25	0.646	0.0622	35	0.846	0.0817	45	1.116	0.1081	55	1.465	0.1424	57.5	1.688	0.1645	62.5	1.950	0.1905		$\text{MgSO}_3 \cdot 3\text{H}_2\text{O}$		38	1.034	0.1001	42	0.937	0.0906	46	0.897	0.0867	50	0.844	0.0815	55	0.817	0.0789	60	0.758	0.0731	62.5	0.748	0.0722	65	0.720	0.0694	75	0.664	0.0640	85	0.623	0.0600	95	0.615	0.0592
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METHOD APPARATUS/PROCEDURE: Saturation method. Equilibrium was established after several hours. Magnesium was determined as the sulfate, sulfite by iodometric titration.	SOURCE AND PURITY OF MATERIALS: Magnesium sulfite was precipitated from aqueous $\text{Mg}(\text{HSO}_3)_2$ solutions obtained from MgCO_3 dissolved in oxygen-free water by passing SO_2 . ESTIMATED ERROR: Deviation in several experiments (2 - 3) is 0.3%. REFERENCES:																																																																				

COMPONENTS: 1. Magnesium sulfite; $MgSO_3$; [7757-88-2] 2. Water; H_2O ; [7732-18-5]	ORIGINAL MEASUREMENTS: Markant, H.P.; Phillips, N.D.; Shah, I.S. <i>Tappi</i> 1965, 48, 648-53.
VARIABLES: Temperature: 318 - 368 K	PREPARED BY: B. Engelen, H.D. Lutz

EXPERIMENTAL VALUES:

The authors give a solubility diagram for $MgSO_3 \cdot 6H_2O$ [13446-29-2] and two other magnesium sulfite hydrates ($MgSO_3 \cdot xH_2O$ and $MgSO_3 \cdot x'H_2O$) of unknown composition. One value of $MgSO_3 \cdot 3H_2O$ [19086-20-5] at 60°C is also given. The scale is given in mass % of SO_2 as $MgSO_3$ and °F by the authors. A scale in mass % of $MgSO_3$ and °C has been added by the compilers.



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(continued on next page)

AUXILIARY INFORMATION

METHOD APPARATUS/PROCEDURE:

Saturation method. Saturated solutions were prepared by adding:

$MgSO_3 \cdot 6H_2O$ to water (Δ)

SO_2 gas to a MgO slurry ()

MgO to a $Mg(HSO_3)_2$ solution (o)

The solutions were analysed for sulfite.

Method not given.

SOURCE AND PURITY OF MATERIALS:

$Mg(HSO_3)_2$ solutions and $MgSO_3 \cdot 6H_2O$ were prepared by adding SO_2 gas to a slurry of MgO in distilled water.

ESTIMATED ERROR:

Not given.

REFERENCES:

<p>COMPONENTS:</p> <p>1. Magnesium sulfite; MgSO_3; [7757-88-2]</p> <p>2. Water; H_2O; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Markant, H.P.; Phillips, N.D.; Shah, I.S.</p> <p><i>Tappi</i> 1965, 48, 648-53.</p>
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EXPERIMENTAL VALUES (continued):

The following numerical data were estimated from the diagram by the compilers.

t/°C	$\text{MgSO}_3 \cdot 6\text{H}_2\text{O}$		$\text{MgSO}_3 \cdot x\text{H}_2\text{O}$		$\text{MgSO}_3 \cdot x'\text{H}_2\text{O}$	
	mass %	m/mol kg^{-1}	mass %	m/mol kg^{-1}	mass %	m/mol kg^{-1}
45	1.23	0.119				
50	1.46	0.142				
55	1.81	0.176				
60	2.21	0.216	2.03	0.198	0.75 ^a	0.072 ^a
65	2.75	0.271	1.85	0.180		
70	3.37	0.334	1.67	0.163		
75	4.21	0.421	1.53	0.149	3.41	0.338
80	5.35	0.541	1.43	0.139	3.14	0.311
83	7.29	0.753	1.38	0.134	3.08	0.304
85			1.34	0.130	2.97	0.293
90			1.27	0.123	2.82	0.278
95			1.26	0.122	2.71	0.267
100			1.24	0.120	2.63	0.259

^a $\text{MgSO}_3 \cdot 3\text{H}_2\text{O}$ as solid phase.

<p>COMPONENTS:</p> <p>1. Magnesium sulfite; $MgSO_3$; [7757-88-2]</p> <p>2. Water; H_2O; [7732-18-5]</p>	<p>ORIGINAL MEASUREMENTS:</p> <p>Rodin, I.V.; Margulis, E.V.</p> <p><i>Zh. Neorg. Khim.</i> <u>1983</u>, 28, 258-9; <i>Russ. J. Inorg. Chem. (Eng. Transl.)</i> <u>1983</u>, 28, 144.</p>															
<p>VARIABLES:</p> <p>Four temperatures: 293 - 363 K</p>	<p>PREPARED BY:</p> <p>B. Engelen</p>															
<p>EXPERIMENTAL VALUES:</p> <p>Solubilities of magnesium sulfite in water at various temperatures are reported.</p> <table border="1" data-bbox="447 544 894 725"> <thead> <tr> <th>t/°C</th> <th>$MgSO_3$ 10^4 mass %</th> <th>10^2 m/mol kg^{-1a}</th> </tr> </thead> <tbody> <tr> <td>20</td> <td>3140</td> <td>3.018</td> </tr> <tr> <td>50</td> <td>3520</td> <td>3.384</td> </tr> <tr> <td>70</td> <td>3870</td> <td>3.722</td> </tr> <tr> <td>90</td> <td>4100</td> <td>3.944</td> </tr> </tbody> </table> <p>^a Calculated by compiler.</p>		t/°C	$MgSO_3$ 10^4 mass %	10^2 m/mol kg ^{-1a}	20	3140	3.018	50	3520	3.384	70	3870	3.722	90	4100	3.944
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<p>METHOD APPARATUS/PROCEDURE:</p> <p>Saturation method. Equilibrium was established by stirring the saturated solutions in thermostatically controlled glass tubes. Equilibrium was tested for analytically. 4 hr are reported to be sufficient. Magnesium was determined gravimetrically.</p>	<p>SOURCE AND PURITY OF MATERIALS:</p> <p>Magnesium sulfite, claimed to be $MgSO_3 \cdot 3.5H_2O$ [85017-92-1], was obtained by precipitation from $MgSO_4$ solutions with Na_2SO_3 (1).</p> <p>ESTIMATED ERROR:</p> <p>Not given.</p> <p>REFERENCES:</p> <p>1. Margulis, E.V.; Grishankina, N.S. <i>Zh. Neorg. Khim.</i> <u>1963</u>, 8, 2638.</p>															