Correction

Isopiestic Investigation of the Osmotic and Activity Coefficients of Aqueous $MgSO_4$ and the Solubility of $MgSO_4{\cdot}7H_2O$(cr) at 298.15 K: Thermodynamic Properties of the $MgSO_4 + H_2O$ System to 440 K. Donald G. Archer and Joseph A. Rard* *J. Chem. Eng. Data* **1998**, *43*, 791−806.

An error has been discovered in the program used to develop the ion-interaction model of $MgSO_4$(aq) for the titled article. The nature of this error is that it affected only heat capacity calculations. The ion-interaction model was refitted following correction of the error, and tables of corrected parameters are given below (corrected Tables 3 and 4). Significant changes in the discussion, in the conclusions, or in the quality of the representation of the experimental results did not arise due to the recalculation. The only observed significant changes in the representation were a slightly poorer fit to the enthalpy of dilution results at 423 K and a slightly better fit to the heat capacity results at 448 K. However, in the corrected model, three fewer parameters are required to represent the temperature dependencies of the five ion-interaction parameters. The original set of parameters tabulated in the title article adequately reproduce the component activities and the enthalpy of $MgSO_4$(aq), and they could continue to be used for such quantities. However, they might not give an accurate reproduction of the apparent molar heat capacity at some molalities and some temperatures. In regions of temperature and molality where accurate measurements existed, the differences of the osmotic and activity coefficients calculated from the revised parameters compared to those given in Tables 6 and 7 of the title article are insignificant (typically ≤0.001 for the osmotic coefficient ϕ). At the standard temperature of 298.15 K, for example, for ϕ the differences are ≤0.0004 between m = (0.1 and 3.5) mol·kg^{-1}, and the mean activity coefficients $\gamma_\pm$ are likewise only changed by ≤0.0005. Under the conditions where properties are being extrapolated, for example 348.15 K and 5.0 mol·kg^{-1} or 348.15 K and 0.01 mol·kg^{-1}, differences can be somewhat larger.

Table 3. Least-Squares Estimated Parameters for the Ion-Interaction Model of the Thermodynamic Properties of $MgSO_4$(aq)

parameter	value	parameter	value	parameter	value[a]
$b_{1,1}$	1.153 221 789 493 31	$b_{3,1}$	1488.345 222 230 81	$b_{5,1}$	0.345 492 915 256 915
$b_{1,2}$	0.843 232 671 108 833	$b_{3,2}$	1101.713 415 097 29	$b_{5,2}$	−0.601 888 392 953 589
$b_{1,3}$	−3.046 931 078 887 08	$b_{3,3}$		$b_{5,3}$	3.886 315 801 358 16
$b_{1,4}$		$b_{3,4}$		$b_{5,4}$	
$b_{1,5}$	−45.215 315 980 288 8	$b_{3,5}$	−105118.313 311 583	$b_{5,5}$	
$b_{1,6}$		$b_{3,6}$	365.877 207 829 097	$b_{5,6}$	
$b_{1,7}$	0.804 220 300 015 396	$b_{3,7}$	532.320 123 152 699	$b_{5,7}$	
$b_{2,1}$	4.570 403 387 413 21	$b_{4,1}$	0.016 406 071 874 678 6		
$b_{2,2}$	−0.930 831 401 941 790	$b_{4,2}$	−0.028 798 849 285 426 8	$\Delta_{sol}G^\circ_{T,p_r(MgSO_4{\cdot}7H_2O)}$	10.579 ± 0.062 kJ·mol^{-1}
$b_{2,3}$	12.700 011 002 451 5	$b_{4,3}$	0.146 576 137 508 310	$\Delta_{sol}S^\circ_{T,p_r(MgSO_4{\cdot}7H_2O)}$	5.83 ± 0.99 J·K^{-1}·mol^{-1}
$b_{2,4}$	−0.586 457 145 550 298	$b_{4,4}$		$\Delta_{sol}G^\circ_{T,p_r(MgSO_4{\cdot}6H_2O)}$	8.941 ± 0.069 kJ·mol^{-1}
$b_{2,5}$		$b_{4,5}$		$\Delta_{sol}S^\circ_{T,p_r(MgSO_4{\cdot}6H_2O)}$	−43.13 ± 0.81 J·K^{-1}·mol^{-1}
$b_{2,6}$		$b_{4,6}$			
$b_{2,7}$		$b_{4,7}$			

[a] The ± values are 95% confidence intervals within the global data representation.

Table 4. Values of the Ion-Interaction Parameters at Selected Temperatures[a]

T/K	$\beta^{(0)}_{MX}$	$\beta^{(1)}_{MX}$	$\beta^{(2)}_{MX}$	$C^{(0)}_{MX}$	$C^{(1)}_{MX}$
273.15	−0.189 24	3.6645	−32.1531	0.024 522	0.520 54
298.15	−0.030 89	3.7687	−37.3659	0.016 406	0.345 49
323.15	0.079 18	3.8196	−48.9020	0.010 122	0.219 31
348.15	0.146 20	3.9463	−70.8712	0.005 671	0.141 71
373.15	0.174 65	4.1908	−108.126	0.003 052	0.112 68
398.15	0.167 95	4.5709	−167.350	0.002 648	0.132 24
423.15	0.127 88	5.0952	−258.488	0.003 310	0.200 37

[a] The units are kg·mol^{-1} for $\beta^{(0)}_{MX}$, for $\beta^{(1)}_{MX}$, and for $\beta^{(2)}_{MX}$; and kg^2·mol^{-2} for $C^{(0)}_{MX}$ and for $C^{(1)}_{MX}$.

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