The binary system lithium tellurite - water has been studied only once (1). The regression equation for the data is

\[ y = 23.5 - 0.505(T - 273.2) + 0.00542(T - 273.2)^2 - 0.0000234(T - 273.2)^3 \]

\[ s = 0.08 \text{ (6 points)} \]

where \( y = 100 \% \) is the concentration of lithium tellurite in mass %, \( T \) is the temperature in K, and \( s \) is the standard deviation of the dependent variable about the regression line.

**TENTATIVE (SMOOTHED) VALUES**

<table>
<thead>
<tr>
<th>( T/K )</th>
<th>Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mass %</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>303.2</td>
<td>12.60</td>
</tr>
<tr>
<td>313.2</td>
<td>10.47</td>
</tr>
<tr>
<td>323.2</td>
<td>8.88</td>
</tr>
<tr>
<td>333.2</td>
<td>7.66</td>
</tr>
<tr>
<td>343.2</td>
<td>6.68</td>
</tr>
<tr>
<td>353.2</td>
<td>5.81</td>
</tr>
</tbody>
</table>

**SODIUM TELLURITE**

There has been no study of the binary system sodium tellurite - water, but some data are available from ternary systems (2 - 5). It was not possible to fit a satisfactory regression equation to the available data, because of the lack of good agreement and the small number of points available. The solid phase was \( \text{Na}_2\text{TeO}_3.5\text{H}_2\text{O} \) [22451-06-5], except at 363.2 K, where it was the anhydrous salt.

**TENTATIVE VALUES**

<table>
<thead>
<tr>
<th>( T/K )</th>
<th>Solubility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mass %</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>298.2</td>
<td>43.03</td>
</tr>
<tr>
<td>303.2</td>
<td>46.23</td>
</tr>
<tr>
<td>333.2</td>
<td>51.68</td>
</tr>
<tr>
<td>343.2</td>
<td>55.54</td>
</tr>
<tr>
<td>363.2</td>
<td>52.46</td>
</tr>
</tbody>
</table>
COMPONENTS:

Tellurites

CRITICAL EVALUATION: (continued)

TERNARY SYSTEMS

The ternary systems studied were sodium tellurite - sodium hydroxide - water (2,3), sodium tellurite - sodium carbonate - water (4,5), sodium tellurite - sulfuric acid - water (6), sodium tellurite - perchloric acid - water (7), sodium selenite - sodium tellurite - water (8) and sodium tellurite - ethanol - water (9). No comparisons were possible.

OTHER TELLURITES

The solubility of cesium tellurite was found to be 67.65% (molality 1.550 mol/kg) at 291.1 K (10).

The solubilities of some sparingly soluble tellurites are reported to be as follows:

<table>
<thead>
<tr>
<th>Ion</th>
<th>$K_{so}$</th>
<th>$pK_{so}$</th>
<th>T/K</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ba$^{2+}$</td>
<td>$8.24 \times 10^{-8}$ to $2.17 \times 10^{-5}$ mol$^2$dm$^{-6}$</td>
<td>$4.66 - 7.08$</td>
<td>298.2</td>
<td>11</td>
</tr>
<tr>
<td>Co$^{2+}$</td>
<td>$3.1 \times 10^{-7}$ mol$^2$dm$^{-6}$</td>
<td>6.51</td>
<td>298.2?</td>
<td>12</td>
</tr>
<tr>
<td>Ni$^{2+}$</td>
<td>$2.34 \times 10^{-10}$ mol$^2$dm$^{-6}$ (HCl)</td>
<td>9.63</td>
<td>298.2?</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>$3.84 \times 10^{-10}$ mol$^2$dm$^{-6}$ (H$_2$SO$_4$)</td>
<td>9.42</td>
<td>298.2?</td>
<td>12</td>
</tr>
<tr>
<td>Cu$^{2+}$</td>
<td>$1.11 \times 10^{10}$ mol$^2$dm$^{-6}$ (H$_2$SO$_4$)</td>
<td>9.95</td>
<td>298.2?</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>$1.6 \times 10^{-11}$ mol$^2$dm$^{-6}$ (HCl)</td>
<td>10.80</td>
<td>298.2?</td>
<td>12</td>
</tr>
<tr>
<td>Ag$^+$</td>
<td>$3.7 \times 10^{-3}$ mol$^3$dm$^{-9}$</td>
<td>2.43??</td>
<td>298.2</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>$1.41 \times 10^{-18}$ mol$^3$dm$^{-9}$</td>
<td>17.85</td>
<td>298.2</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>$1.17 \times 10^{-18}$ mol$^3$dm$^{-9}$ (recalc.)</td>
<td>17.93</td>
<td>298.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$8.71 \times 10^{-19}$ mol$^3$dm$^{-9}$</td>
<td>18.06</td>
<td>293.2</td>
<td>15</td>
</tr>
<tr>
<td>Pb$^{2+}$</td>
<td>$4.07 \times 10^{-11}$ to $5.93 \times 10^{-8}$ mol$^2$dm$^{-6}$</td>
<td>$7.23 - 10.99$</td>
<td>298.2</td>
<td>11</td>
</tr>
</tbody>
</table>

GENERAL COMMENTS

It is evident that there is very little information available on the solubility of tellurites, and unfortunately much of what is available appears to be not very reliable. Of the silver tellurite values, the values reported in (14) and (15) are in reasonable agreement, so it seems that the values in (13) should be rejected.
REFERENCES


