

COMPONENTS: 1. Barium tellurite; BaTeO ₃ ; [14899-38-8] 2a. Nitric acid; HNO ₃ ; [7697-37-2] 2b. Hydrochloric acid; HCl; [7647-01-0] 3a. Sodium nitrate; NaNO ₃ ; [7631-99-4] 3b. Sodium chloride; NaCl; [7647-14-5] 4. Water; H ₂ O; [7732-18-5]	ORIGINAL MEASUREMENTS: Ganelina, E.Sh.; Merzon, V.V.; Biryukov, V.P. <i>Izv. Vyssh. Ucheb. Zaved. Khim. Khim. Tekhnol.</i> 1969, 12, 1465-7.																																																	
VARIABLES: One temperature: 298 K pH varied.	PREPARED BY: Mary R. Masson																																																	
EXPERIMENTAL VALUES: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">pH</th> <th style="text-align: center;">[Ba²⁺] x 10³ mol dm⁻³</th> <th style="text-align: center;">α_{L(H)}</th> <th style="text-align: center;">K_{s0} x 10⁴ mol dm⁻⁶</th> <th style="text-align: center;">α_{L(H)}[*]</th> <th style="text-align: center;">K_{s0}[*] mol² dm⁻⁶</th> <th></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">8.90</td> <td style="text-align: center;">11.0</td> <td style="text-align: center;">1.0070</td> <td style="text-align: center;">1.2</td> <td style="text-align: center;">5.578</td> <td style="text-align: center;">2.7 x 10⁻⁵</td> <td></td> </tr> <tr> <td style="text-align: center;">8.10</td> <td style="text-align: center;">4.42</td> <td style="text-align: center;">1.0341</td> <td style="text-align: center;">0.18</td> <td style="text-align: center;">30.116</td> <td style="text-align: center;">6.49 x 10⁻⁷</td> <td style="text-align: center;">nitrate</td> </tr> <tr> <td style="text-align: center;">8.75</td> <td style="text-align: center;">8.35</td> <td style="text-align: center;">1.0101</td> <td style="text-align: center;">0.69</td> <td style="text-align: center;">7.470</td> <td style="text-align: center;">9.33 x 10⁻⁶</td> <td style="text-align: center;">medium</td> </tr> <tr> <td style="text-align: center;">8.55</td> <td style="text-align: center;">6.28</td> <td style="text-align: center;">1.0163</td> <td style="text-align: center;">0.39</td> <td style="text-align: center;">11.268</td> <td style="text-align: center;">3.5 x 10⁻⁶</td> <td></td> </tr> <tr> <td style="text-align: center;">7.59</td> <td style="text-align: center;">2.83</td> <td style="text-align: center;">2.475</td> <td style="text-align: center;">0.032</td> <td style="text-align: center;">97.21</td> <td style="text-align: center;">8.24 x 10⁻⁸</td> <td style="text-align: center;">chloride</td> </tr> <tr> <td style="text-align: center;">7.68</td> <td style="text-align: center;">2.64</td> <td style="text-align: center;">2.252</td> <td style="text-align: center;">0.031</td> <td style="text-align: center;">79.76</td> <td style="text-align: center;">8.85 x 10⁻⁸</td> <td style="text-align: center;">medium</td> </tr> </tbody> </table> <p>The starred (*) values were recalculated by the compiler, since the author had used erroneous values for the dissociation constants of tellurous acid (from (1)). The compiler used values from (2).</p> <p><u>Note:</u> [Te_{tot}] = [Ba²⁺] and [TeO₃²⁻] = [Te_{tot}]/α_{L(H)}</p> <p>The inconsistencies in the results may be caused by interference by atmospheric carbon dioxide, which can cause precipitation of barium carbonate in solutions as acidic as pH 6.1 (log K_{s0} for barium carbonate is -9.4) (3).</p>		pH	[Ba ²⁺] x 10 ³ mol dm ⁻³	α _{L(H)}	K _{s0} x 10 ⁴ mol dm ⁻⁶	α _{L(H)} [*]	K _{s0} [*] mol ² dm ⁻⁶		8.90	11.0	1.0070	1.2	5.578	2.7 x 10 ⁻⁵		8.10	4.42	1.0341	0.18	30.116	6.49 x 10 ⁻⁷	nitrate	8.75	8.35	1.0101	0.69	7.470	9.33 x 10 ⁻⁶	medium	8.55	6.28	1.0163	0.39	11.268	3.5 x 10 ⁻⁶		7.59	2.83	2.475	0.032	97.21	8.24 x 10 ⁻⁸	chloride	7.68	2.64	2.252	0.031	79.76	8.85 x 10 ⁻⁸	medium
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METHOD APPARATUS/PROCEDURE: Barium tellurite was stirred with nitric and hydrochloric acid solutions of various concentrations until equilibrium was established. The pH was determined by means of an LPU-01 instrument and a glass electrode. The barium concentration was determined by complexometric titration in ammonia buffer, with Eriochrome Black T as indicator.	SOURCE AND PURITY OF MATERIALS: Barium tellurite was prepared by reaction of sodium tellurite with barium nitrate.																																																	
	ESTIMATED ERROR: The spread in K _{s0} values is very large; a value for s would not be meaningful.																																																	
	REFERENCES: 1. Blanc, E. J. <i>Chem. Phys.</i> 1920, 18, 40. 2. Masson, M.R. <i>J. Inorg. Nucl. Chem.</i> 1976, 38, 545-8. 3. Kragten, J. <i>Atlas of Metal-Ligand Equilibria in Aqueous Solution</i> Horwood, Chichester, 1977.																																																	