COMPONENTS:
1. Barium tellurite; BaTeO₃; [14699-38-8]
2a. Nitric acid; HNO₃; [7697-37-2]
2b. Hydrochloric acid; HCl; [7647-01-0]
3a. Sodium nitrate; NaN₃; [7631-99-4]
3b. Sodium chloride; NaCl; [7647-14-5]
4. Water; H₂O; [7732-18-5]

ORIGINAL MEASUREMENTS:
Ganelina, E.Sh.; Merzon, V.V.; Biryukov, V.P.

PREPARED BY:
Mary R. Masson

EXPERIMENTAL VALUES:

<table>
<thead>
<tr>
<th>pH</th>
<th>[Ba²⁺] x 10³ mol dm⁻³</th>
<th>aL(H)</th>
<th>K₈₀ x 10⁶ mol dm⁻⁶</th>
<th>a₀L(H)</th>
<th>K₈₀* mol² dm⁻⁶</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.90</td>
<td>11.0</td>
<td>1.0070</td>
<td>1.2</td>
<td>5.578</td>
<td>2.7 x 10⁻⁵ nitrate</td>
</tr>
<tr>
<td>8.10</td>
<td>4.42</td>
<td>1.0341</td>
<td>0.18</td>
<td>30.116</td>
<td>6.49 x 10⁻⁷ medium</td>
</tr>
<tr>
<td>8.75</td>
<td>8.35</td>
<td>1.0101</td>
<td>0.69</td>
<td>7.470</td>
<td>9.33 x 10⁻⁶ medium</td>
</tr>
<tr>
<td>8.55</td>
<td>6.28</td>
<td>1.0163</td>
<td>0.39</td>
<td>11.268</td>
<td>3.5 x 10⁻⁶ medium</td>
</tr>
<tr>
<td>7.59</td>
<td>2.83</td>
<td>2.475</td>
<td>0.032</td>
<td>97.21</td>
<td>8.24 x 10⁻⁸ chloride</td>
</tr>
<tr>
<td>7.68</td>
<td>2.64</td>
<td>2.252</td>
<td>0.031</td>
<td>79.76</td>
<td>8.85 x 10⁻⁸ medium</td>
</tr>
</tbody>
</table>

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).

Note: [Te₅⁺] = [Ba²⁺] and [TeO₂⁻] = [Te₅⁺]/aL(H)

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 K₈₀ for barium carbonate is -9.4) (3).

AUXILIARY INFORMATION

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 K₈₀ values is very large; a value for s would not be meaningful.

REFERENCES: