Supplementary Table 1: Standards molal thermodynamic data of aqueous educts and products used in thermodynamic calculations.

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| --- | --- | --- | --- | --- |
| **Compound** | **∆Gf° (kJ mol-1)** | **∆Hf° (kJ mol-1)** | **∆Vf° (cm3 mol-1)** | **Reference** |
| Proton (H+) | 0.0 | 0.0 | 0.0 | Shock et al. (1997) |
| Hydrogen (H2) | -528.34 | -675.69 | -5.02 | Wagman et al. (1982)  Shock and Helgeson (1990) |
| Water | -237.2 | -285.8 | 18.0 | Amend and Shock (2001) |
| Carbonate (CO32-) | -586.9 | -692.0 | 24.6 | Shock et al. (1997) |
| Carbon monoxide | -120.08 | -89.48 | 32.8 | Fenn (1971),  Oelkers et al. (1995) |
| Formate | -351.0 | -425.7 | 26.2 | Shock and Helgeson (1990) |
| Acetate | -369.4 | -486.4 | 40.5 | Shock and Helgeson (1990) |
| Propionate | -363.29 | -513.43 | 54.95 | Shock and Helgeson (1990) |
| Butyrate | -354.25 | -535.62 | 70.30 | Shock and Helgeson (1990) |
| Glucose | -915.9 | -1262.2 | 112.2 | Amend and Plyasunov (2001) |
| Sulfate (SO42-) | -744.96 | -910.21 | 13.88 | Shock et al. (1997) |
| Sulfide (HS-) | 11.97 | -16.12 | 20.65 | Shock et al. (1997) |

**Supplementary References**

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