

**Table 1.** Overview of reactions studied and of their Gibbs free energies and redox potentials under standard conditions

Reactions		$\Delta G^{\circ}$ [kJ/mol H <sub>2</sub> ]	$E^{\circ}$ [mV]
<b>H<sub>2</sub>-producing reactions</b>			
C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> + 4 H <sub>2</sub> O	↔ 2 CH <sub>3</sub> -COO <sup>-</sup> + 2 HCO <sub>3</sub> <sup>-</sup> + 4 H <sup>+</sup> + 4 H <sub>2</sub>	-51.5	-681
CH <sub>3</sub> -CHOH-COO <sup>-</sup> + 2 H <sub>2</sub> O	↔ CH <sub>3</sub> -COO <sup>-</sup> + HCO <sub>3</sub> <sup>-</sup> + H <sup>+</sup> + 2 H <sub>2</sub>	-2.0	-424
CH <sub>3</sub> OH + 2 H <sub>2</sub> O	↔ HCO <sub>3</sub> <sup>-</sup> + H <sup>+</sup> + 3 H <sub>2</sub>	+7.7	-374
<b>H<sub>2</sub>-consuming reactions</b>			
4 H <sub>2</sub> + 2 HCO <sub>3</sub> <sup>-</sup> + H <sup>+</sup>	↔ CH <sub>3</sub> -COO <sup>-</sup> + 4 H <sub>2</sub> O	-26.1	-279
H <sub>2</sub> + S <sup>0</sup>	↔ HS <sup>-</sup> + H <sup>+</sup>	-27.8	-270
4 H <sub>2</sub> + HCO <sub>3</sub> <sup>-</sup> + H <sup>+</sup>	↔ CH <sub>4</sub> + 3 H <sub>2</sub> O	-33.9	-238
4 H <sub>2</sub> + SO <sub>4</sub> <sup>2-</sup> + H <sup>+</sup>	↔ 4 H <sub>2</sub> O + HS <sup>-</sup>	-38.0	-217
4 H <sub>2</sub> + S <sub>2</sub> O <sub>3</sub> <sup>2-</sup>	↔ 2 HS <sup>-</sup> + 3 H <sub>2</sub> O	-43.5	-189
3 H <sub>2</sub> + SO <sub>3</sub> <sup>2-</sup>	↔ HS <sup>-</sup> + 3 H <sub>2</sub> O	-57.2	-118
H <sub>2</sub> + caffeate	↔ Hydrocaffeate	-85.5 <sup>a</sup>	+29
H <sub>2</sub> + fumarate	↔ Succinate	-86.2	+32
4 H <sub>2</sub> + NO <sub>3</sub> <sup>-</sup> + 2 H <sup>+</sup>	↔ NH <sub>4</sub> <sup>+</sup> + 3 H <sub>2</sub> O	-149.9	+363

Values calculated from Thauer et al. (1977).  $E^{\circ}$  of the couples accepting electrons from H<sub>2</sub> was calculated relative to the redox potential of H<sub>2</sub> (-414 mV)

<sup>a</sup> Estimated from Grbić-Galić (1985)