

**Table 1** Values for Gibbs free energies of formation from the elements for the compounds for which free-energy changes in their reactions are described in Tables 4–6 or in the text [derived from or recalculated from Latimer (1952), Brasted (1961), Thauer et al. (1977), and Bard et al. (1985)]. Values in paranthesis were calculated by the group contribution method of Mavrovouniotis (1990, 1991) or calculated from the data of Mavrovouniotis (1990) (*ND* not determined)

Compound	Gibbs free energy of formation ( $\Delta G_f^\circ$ as kJ mol <sup>-1</sup> )	
S <sub>2</sub> O <sub>3</sub> <sup>2-</sup>	-513.4	(-501.7)
S <sub>3</sub> O <sub>6</sub> <sup>2-</sup>	-958.1	(-944.3)
S <sub>4</sub> O <sub>6</sub> <sup>2-</sup>	-1,022.2	(-959.8)
H <sub>2</sub> S <sub>4</sub> O <sub>6</sub>	-991.6	(-1,039.1)
S <sub>5</sub> O <sub>6</sub> <sup>2-</sup>	-956.0	(-920.1)
S <sub>6</sub> O <sub>6</sub> <sup>2-</sup>	ND <sup>a</sup>	(-935.5)
S <sub>7</sub> O <sub>6</sub> <sup>2-</sup>	ND <sup>a</sup>	(-895.8)
S <sup>2-</sup>	-85.8	
HS <sup>-</sup>	-12.1	
H <sub>2</sub> S	-27.6	
SO <sub>3</sub> <sup>2-</sup>	-486.6	(-495.4)
HSO <sub>3</sub> <sup>-</sup>	-527.8	
H <sub>2</sub> SO <sub>3</sub>	-537.9	
SO <sub>4</sub> <sup>2-</sup>	-744.6	
HSO <sub>4</sub> <sup>-</sup>	-756.0	
H <sub>2</sub> SO <sub>4</sub>	-742.0	
COS	-169.2	
SCN <sup>-</sup>	+88.7	
HSCN	+92.7	
OCN <sup>-</sup>	-98.7	
HOCN	-120.9	
H <sub>2</sub> O	-237.2	(-236.8)
OH <sup>-</sup>	-157.3	(-197.1)
CO <sub>2</sub>	-386.0	
NO <sub>2</sub> <sup>-</sup>	-37.2	(-29.3)
NO <sub>3</sub> <sup>-</sup>	-111.0	(-115.1)
NH <sub>3</sub>	-26.6	
NH <sub>4</sub> <sup>+</sup>	-79.5	(-75.7)
NH <sub>2</sub> OH	-23.4	
CN <sup>-</sup>	+165.7	
C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> (fructose)	-915.4	

<sup>a</sup>Published data for polythionates with six or more S-atoms have not been found in the literature, so the  $\Delta G_f^\circ$  values given above for hexa- and heptathionate ions are those calculated by the group contribution method of Mavrovouniotis (1990, 1991)