

H₃PO₄+H₃PO₄ → H₄P₂O₇ + H₂O						
ΔG _{aq} Exp.=9.5 kcal/mol						
n _w H ₃ PO ₄ \n _w H ₃ PO ₄						
ΔG _{aq}						
nw of Dimer	0\0	0\1	0\2	0\3	0\4	0\5
0	10.9	9.5	15.7	14.2	15.0	13.0
1	3.2	1.8	8.0	6.5	7.3	5.3
2	4.3	3.0	9.1	7.6	8.4	6.4
3	6.2	4.8	10.9	9.4	10.2	8.3
4	-1.2	-2.5	3.6	2.1	2.9	1.0
5	-5.1	-6.4	-0.3	-1.8	-1.0	-3.0
6	-9.5	-10.8	-4.7	-6.2	-5.4	-7.3
nw of Dimer	1\0	1\1	1\2	1\3	1\4	1\5
0	9.5	8.2	14.3	12.8	13.6	11.7
1	1.8	0.5	6.6	5.1	5.9	4.0
2	3.0	1.6	7.7	6.2	7.0	5.1
3	4.8	3.4	9.6	8.1	8.9	6.9
4	-2.5	-3.9	2.3	0.7	1.6	-0.4
5	-6.4	-7.8	-1.7	-3.2	-2.4	-4.3
6	-10.8	-12.2	-6.1	-7.6	-6.8	-8.7
nw of Dimer	2\0	2\1	2\2	2\3	2\4	2\5
0	15.7	14.3	20.4	18.9	19.7	17.8
1	8.0	6.6	12.7	11.2	12.1	10.1
2	9.1	7.7	13.8	12.3	13.2	11.2
3	10.9	9.6	15.7	14.2	15.0	13.1
4	3.6	2.3	8.4	6.9	7.7	5.7
5	-0.3	-1.7	4.4	2.9	3.8	1.8
6	-4.7	-6.1	0.1	-1.5	-0.6	-2.6
nw of Dimer	3\0	3\1	3\2	3\3	3\4	3\5
0	14.2	12.8	18.9	17.4	18.2	16.3
1	6.5	5.1	11.2	9.7	10.5	8.6
2	7.6	6.2	12.3	10.8	11.6	9.7
3	9.4	8.1	14.2	12.7	13.5	11.5
4	2.1	0.7	6.9	5.4	6.2	4.2
5	-1.8	-3.2	2.9	1.4	2.3	0.3
6	-6.2	-7.6	-1.5	-3.0	-2.1	-4.1
nw of Dimer	4\0	4\1	4\2	4\3	4\4	4\5
0	15.0	13.6	19.7	18.2	19.1	17.1
1	7.3	5.9	12.1	10.5	11.4	9.4
2	8.4	7.0	13.2	11.6	12.5	10.5
3	10.2	8.9	15.0	13.5	14.3	12.4
4	2.9	1.6	7.7	6.2	7.0	5.1
5	-1.0	-2.4	3.8	2.3	3.1	1.1
6	-5.4	-6.8	-0.6	-2.1	-1.3	-3.3
nw of Dimer	5\0	5\1	5\2	5\3	5\4	5\5
0	13.0	11.7	17.8	16.3	17.1	15.2
1	5.3	4.0	10.1	8.6	9.4	7.5

2	6.4	5.1	11.2	9.7	10.5	8.6
3	8.3	6.9	13.1	11.5	12.4	10.4
4	1.0	-0.4	5.7	4.2	5.1	3.1
5	-3.0	-4.3	1.8	0.3	1.1	-0.8
6	-7.3	-8.7	-2.6	-4.1	-3.3	-5.2

H₃PO₄ + H₂PO₄⁻ → H₃P₂O₇⁻ + H₂O						
ΔG _{aq} Exp.=7.5 kcal/mol						
n _w H ₃ PO ₄ \n _w H ₂ PO ₄						
ΔG _{aq}						
nw of Dimer	0\0	0\1	0\2	0\3	0\4	0\5
0	-6.0	-6.5	-4.8	-3.9	-5.4	-1.6
1	-11.0	-11.6	-9.8	-9.0	-10.5	-6.6
2	-5.4	-6.0	-4.2	-3.4	-4.9	-1.1
3	-12.0	-12.5	-10.8	-10.0	-11.4	-7.6
4	-8.5	-9.0	-7.3	-6.5	-7.9	-4.1
5	-8.0	-8.5	-6.8	-6.0	-7.4	-3.6
6	-8.1	-8.6	-6.9	-6.1	-7.6	-3.7
nw of Dimer	1\0	1\1	1\2	1\3	1\4	1\5
0	-7.3	-7.9	-6.1	-5.3	-6.8	-2.9
1	-12.4	-12.9	-11.2	-10.4	-11.8	-8.0
2	-6.8	-7.3	-5.6	-4.8	-6.3	-2.4
3	-13.3	-13.9	-12.1	-11.3	-12.8	-9.0
4	-9.8	-10.4	-8.6	-7.8	-9.3	-5.4
5	-9.3	-9.9	-8.1	-7.3	-8.8	-4.9
6	-9.5	-10.0	-8.2	-7.4	-8.9	-5.1
nw of Dimer	2\0	2\1	2\2	2\3	2\4	2\5
0	-1.2	-1.7	0.0	0.8	-0.7	3.2
1	-6.3	-6.8	-5.0	-4.2	-5.7	-1.9
2	-0.7	-1.2	0.5	1.3	-0.1	3.7
3	-7.2	-7.8	-6.0	-5.2	-6.7	-2.8
4	-3.7	-4.3	-2.5	-1.7	-3.2	0.7
5	-3.2	-3.8	-2.0	-1.2	-2.7	1.2
6	-3.3	-3.9	-2.1	-1.3	-2.8	1.1
nw of Dimer	3\0	3\1	3\2	3\3	3\4	3\5
0	-2.7	-3.3	-1.5	-0.7	-2.2	1.7
1	-7.8	-8.3	-6.6	-5.7	-7.2	-3.4
2	-2.2	-2.7	-1.0	-0.2	-1.7	2.2
3	-8.7	-9.3	-7.5	-6.7	-8.2	-4.3
4	-5.2	-5.8	-4.0	-3.2	-4.7	-0.8
5	-4.7	-5.3	-3.5	-2.7	-4.2	-0.3
6	-4.8	-5.4	-3.6	-2.8	-4.3	-0.5
nw of Dimer	4\0	4\1	4\2	4\3	4\4	4\5
0	-1.9	-2.4	-0.7	0.1	-1.3	2.5
1	-6.9	-7.5	-5.7	-4.9	-6.4	-2.6
2	-1.4	-1.9	-0.2	0.7	-0.8	3.0
3	-7.9	-8.5	-6.7	-5.9	-7.4	-3.5
4	-4.4	-4.9	-3.2	-2.4	-3.9	0.0
5	-3.9	-4.4	-2.7	-1.9	-3.4	0.5
6	-4.0	-4.6	-2.8	-2.0	-3.5	0.4
nw of Dimer	5\0	5\1	5\2	5\3	5\4	5\5
0	-3.8	-4.4	-2.6	-1.8	-3.3	0.6
1	-8.9	-9.4	-7.7	-6.9	-8.4	-4.5

2	-3.3	-3.9	-2.1	-1.3	-2.8	1.1
3	-9.9	-10.4	-8.7	-7.8	-9.3	-5.5
4	-6.4	-6.9	-5.1	-4.3	-5.8	-2.0
5	-5.9	-6.4	-4.6	-3.8	-5.3	-1.5
6	-6.0	-6.5	-4.8	-3.9	-5.4	-1.6

H₂PO₄⁻ + H₂PO₄⁻ → H₂P₂O₇²⁻ + H₂O						
ΔG _{aq} Exp.=7.7 kcal/mol						
n _w H ₂ PO ₄ \n _w H ₂ PO ₄						
ΔG _{aq}						
nw of Dimer	0\0	0\1	0\2	0\3	0\4	0\5
0	-3.8	-4.3	-2.5	-1.7	-3.2	0.6
1	-2.8	-3.4	-1.6	-0.8	-2.3	1.5
2	-2.4	-2.9	-1.1	-0.3	-1.8	2.0
3	-1.7	-2.3	-0.5	0.3	-1.2	2.7
4	-0.5	-1.1	0.7	1.5	0.0	3.9
5	-3.1	-3.7	-1.9	-1.1	-2.6	1.3
6	-2.8	-3.3	-1.6	-0.8	-2.2	1.6
nw of Dimer	1\0	1\1	1\2	1\3	1\4	1\5
0	-4.3	-4.8	-3.1	-2.3	-3.8	0.1
1	-3.4	-3.9	-2.2	-1.4	-2.9	1.0
2	-2.9	-3.4	-1.7	-0.9	-2.4	1.5
3	-2.3	-2.8	-1.1	-0.2	-1.7	2.1
4	-1.1	-1.6	0.1	1.0	-0.5	3.3
5	-3.7	-4.2	-2.4	-1.6	-3.1	0.7
6	-3.3	-3.9	-2.1	-1.3	-2.8	1.1
nw of Dimer	2\0	2\1	2\2	2\3	2\4	2\5
0	-2.5	-3.1	-1.3	-0.5	-2.0	1.8
1	-1.6	-2.2	-0.4	0.4	-1.1	2.8
2	-1.1	-1.7	0.1	0.9	-0.6	3.2
3	-0.5	-1.1	0.7	1.5	0.0	3.9
4	0.7	0.1	1.9	2.7	1.2	5.1
5	-1.9	-2.4	-0.7	0.1	-1.4	2.5
6	-1.6	-2.1	-0.4	0.5	-1.0	2.8
nw of Dimer	3\0	3\1	3\2	3\3	3\4	3\5
0	-1.7	-2.3	-0.5	0.3	-1.2	2.7
1	-0.8	-1.4	0.4	1.2	-0.3	3.6
2	-0.3	-0.9	0.9	1.7	0.2	4.1
3	0.3	-0.2	1.5	2.3	0.8	4.7
4	1.5	1.0	2.7	3.5	2.0	5.9
5	-1.1	-1.6	0.1	0.9	-0.5	3.3
6	-0.8	-1.3	0.5	1.3	-0.2	3.6
nw of Dimer	4\0	4\1	4\2	4\3	4\4	4\5
0	-3.2	-3.8	-2.0	-1.2	-2.7	1.2
1	-2.3	-2.9	-1.1	-0.3	-1.8	2.1
2	-1.8	-2.4	-0.6	0.2	-1.3	2.6
3	-1.2	-1.7	0.0	0.8	-0.7	3.2
4	0.0	-0.5	1.2	2.0	0.5	4.4
5	-2.6	-3.1	-1.4	-0.5	-2.0	1.8
6	-2.2	-2.8	-1.0	-0.2	-1.7	2.1
nw of Dimer	5\0	5\1	5\2	5\3	5\4	5\5
0	0.6	0.1	1.8	2.7	1.2	5.0
1	1.5	1.0	2.8	3.6	2.1	5.9

2	2.0	1.5	3.2	4.1	2.6	6.4
3	2.7	2.1	3.9	4.7	3.2	7.1
4	3.9	3.3	5.1	5.9	4.4	8.3
5	1.3	0.7	2.5	3.3	1.8	5.7
6	1.6	1.1	2.8	3.6	2.1	6.0

$\text{HPO}_4^{2-} + \text{H}_2\text{PO}_4^- \rightarrow \text{HP}_2\text{O}_7^{3-} + \text{H}_2\text{O}$							
$\Delta\text{G}_{\text{aq}} \text{ Exp.} = 7.1 \text{ kcal/mol}$							
$n_w\text{HPO}_4 \backslash n_w\text{H}_2\text{PO}_4$							
$\Delta\text{G}_{\text{aq}}$							
nw of Dimer	0\0	0\1	0\2	0\3	0\4	0\5	
0	-3.2	-3.8	-2.0	-1.2	-2.7	1.1	
1	-4.6	-5.1	-3.4	-2.6	-4.0	-0.2	
2	-5.1	-5.7	-3.9	-3.1	-4.6	-0.7	
3	-4.9	-5.5	-3.7	-2.9	-4.4	-0.5	
4	-10.2	-10.7	-9.0	-8.2	-9.7	-5.8	
5	-13.7	-14.3	-12.5	-11.7	-13.2	-9.3	
6	-13.1	-13.7	-11.9	-11.1	-12.6	-8.7	
nw of Dimer	1\0	1\1	1\2	1\3	1\4	1\5	
0	-1.0	-1.6	0.2	1.0	-0.5	3.4	
1	-2.3	-2.9	-1.1	-0.3	-1.8	2.0	
2	-2.9	-3.4	-1.7	-0.9	-2.3	1.5	
3	-2.7	-3.2	-1.5	-0.7	-2.1	1.7	
4	-8.0	-8.5	-6.8	-5.9	-7.4	-3.6	
5	-11.5	-12.0	-10.3	-9.5	-10.9	-7.1	
6	-10.9	-11.4	-9.7	-8.9	-10.3	-6.5	
nw of Dimer	2\0	2\1	2\2	2\3	2\4	2\5	
0	-0.2	-0.7	1.0	1.8	0.4	4.2	
1	-1.5	-2.1	-0.3	0.5	-1.0	2.9	
2	-2.0	-2.6	-0.8	0.0	-1.5	2.3	
3	-1.8	-2.4	-0.6	0.2	-1.3	2.5	
4	-7.1	-7.7	-5.9	-5.1	-6.6	-2.7	
5	-10.6	-11.2	-9.4	-8.6	-10.1	-6.3	
6	-10.0	-10.6	-8.8	-8.0	-9.5	-5.7	
nw of Dimer	3\0	3\1	3\2	3\3	3\4	3\5	
0	1.0	0.5	2.2	3.0	1.5	5.4	
1	-0.3	-0.9	0.9	1.7	0.2	4.1	
2	-0.9	-1.4	0.3	1.2	-0.3	3.5	
3	-0.7	-1.2	0.5	1.4	-0.1	3.7	
4	-6.0	-6.5	-4.7	-3.9	-5.4	-1.6	
5	-9.5	-10.0	-8.3	-7.4	-8.9	-5.1	
6	-8.9	-9.4	-7.7	-6.8	-8.3	-4.5	
nw of Dimer	4\0	4\1	4\2	4\3	4\4	4\5	
0	-0.5	-1.1	0.7	1.5	0.0	3.9	
1	-1.9	-2.4	-0.7	0.2	-1.3	2.5	
2	-2.4	-2.9	-1.2	-0.4	-1.9	2.0	
3	-2.2	-2.7	-1.0	-0.2	-1.7	2.2	
4	-7.5	-8.0	-6.3	-5.5	-6.9	-3.1	
5	-11.0	-11.5	-9.8	-9.0	-10.5	-6.6	
6	-10.4	-10.9	-9.2	-8.4	-9.9	-6.0	
nw of Dimer	5\0	5\1	5\2	5\3	5\4	5\5	
0	4.4	3.9	5.6	6.5	5.0	8.8	
1	3.1	2.6	4.3	5.1	3.6	7.5	

2	2.6	2.0	3.8	4.6	3.1	7.0
3	2.8	2.2	4.0	4.8	3.3	7.2
4	-2.5	-3.1	-1.3	-0.5	-2.0	1.9
5	-6.0	-6.6	-4.8	-4.0	-5.5	-1.6
6	-5.4	-6.0	-4.2	-3.4	-4.9	-1.0

$\text{HPO}_4^{2-} + \text{HPO}_4^{2-} \rightarrow \text{P}_2\text{O}_7^{4-} + \text{H}_2\text{O}$							
		$\Delta\text{G}_{\text{aq}} \text{ Exp.} = 10.4$				kcal/mol	
$n_w\text{HPO}_4 \backslash n_w\text{HPO}_4$							
$\Delta\text{G}_{\text{aq}}$							
nw of Dimer	0\0	0\1	0\2	0\3	0\4	0\5	
0	19.7	22.0	22.8	24.0	22.5	27.4	
1	15.1	17.3	18.1	19.3	17.8	22.7	
2	11.9	14.1	14.9	16.1	14.6	19.5	
3	10.3	12.5	13.4	14.5	13.0	18.0	
4	-0.9	1.3	2.2	3.3	1.8	6.8	
5	-16.2	-13.9	-13.1	-11.9	-13.4	-8.5	
6	-12.1	-9.9	-9.1	-7.9	-9.4	-4.5	
nw of Dimer	1\0	1\1	1\2	1\3	1\4	1\5	
0	22.0	24.2	25.0	26.2	24.7	29.6	
1	17.3	19.5	20.4	21.5	20.0	25.0	
2	14.1	16.3	17.2	18.3	16.8	21.8	
3	12.5	14.8	15.6	16.8	15.2	20.2	
4	1.3	3.6	4.4	5.6	4.0	9.0	
5	-13.9	-11.7	-10.9	-9.7	-11.2	-6.3	
6	-9.9	-7.7	-6.8	-5.7	-7.2	-2.2	
nw of Dimer	2\0	2\1	2\2	2\3	2\4	2\5	
0	22.8	25.0	25.9	27.1	25.5	30.5	
1	18.1	20.4	21.2	22.4	20.8	25.8	
2	14.9	17.2	18.0	19.2	17.7	22.6	
3	13.4	15.6	16.4	17.6	16.1	21.0	
4	2.2	4.4	5.2	6.4	4.9	9.8	
5	-13.1	-10.9	-10.0	-8.9	-10.4	-5.4	
6	-9.1	-6.8	-6.0	-4.8	-6.4	-1.4	
nw of Dimer	3\0	3\1	3\2	3\3	3\4	3\5	
0	24.0	26.2	27.1	28.2	26.7	31.7	
1	19.3	21.5	22.4	23.6	22.0	27.0	
2	16.1	18.3	19.2	20.4	18.8	23.8	
3	14.5	16.8	17.6	18.8	17.3	22.2	
4	3.3	5.6	6.4	7.6	6.1	11.0	
5	-11.9	-9.7	-8.9	-7.7	-9.2	-4.2	
6	-7.9	-5.7	-4.8	-3.6	-5.2	-0.2	
nw of Dimer	4\0	4\1	4\2	4\3	4\4	4\5	
0	22.5	24.7	25.5	26.7	25.2	30.1	
1	17.8	20.0	20.8	22.0	20.5	25.5	
2	14.6	16.8	17.7	18.8	17.3	22.3	
3	13.0	15.2	16.1	17.3	15.7	20.7	
4	1.8	4.0	4.9	6.1	4.5	9.5	
5	-13.4	-11.2	-10.4	-9.2	-10.7	-5.8	
6	-9.4	-7.2	-6.4	-5.2	-6.7	-1.7	
nw of Dimer	5\0	5\1	5\2	5\3	5\4	5\5	
0	27.4	29.6	30.5	31.7	30.1	35.1	

1	22.7	25.0	25.8	27.0	25.5	30.4
2	19.5	21.8	22.6	23.8	22.3	27.2
3	18.0	20.2	21.0	22.2	20.7	25.7
4	6.8	9.0	9.8	11.0	9.5	14.4
5	-8.5	-6.3	-5.4	-4.2	-5.8	-0.8
6	-4.5	-2.2	-1.4	-0.2	-1.7	3.2