

Supplementary information

Table 1: Thermodynamic values of Reactions (R3 - R7) for $x=2$, i.e. evaporation of neutral O_2 from $O_2^-(H_2O)_n$ clusters (in kJ/mol). Entropy is not included.

n	R3 (x=2)	R4 ¹	R5 ²	R6 ³	R7 ⁴
1	136	92	44	0	~0
2	198	169	44	-13	-2
3	248	235	44	-35	5
4	287	295	44	-64	12
5	299	353	44	-100	2
6	308	407	44	-138	-4
7	319	450	44	-170	-5
8	353	518	44	-211	2
9	384	572	44	-237	5
10	398	619	44	-272	7
11	407	666	44	-299	-4
12	432	714	44	-326	1

Table 2: Thermodynamic values of Reactions (R3 - R7) for $x=3$, i.e. evaporation of neutral O_3 from $O_3^-(H_2O)_n$ clusters (in kJ/mol). Entropy is not included.

n	R3 (x=3)	R4 ¹	R5 ²	R6 ³	R7 ⁴
1	281	78	203	0	~0
2	330	141	203	-13	-2
3	368	195	203	-35	5
4	406	255	203	-64	12
5	428	324	203	-100	2
6	428	367	203	-138	-4
7	457	429	203	-170	-5
8	483	489	203	-211	2
9	511	541	203	-237	5
10	534	597	203	-272	7
11	548	649	203	-299	-4
12	559	682	203	-326	1

Footnotes:

1. Accumulated binding energies of $O_x^-(H_2O)_n$ clusters (This study).
2. Electron affinities of O_2 and O_3 (Lide, 1997).
3. Accumulated binding energies of neutral water clusters (Lee et al. 2005)
4. Adiabatic electron affinities of neutral water clusters (Lee et al. 2003, 2005).