01 Jan 1986

Erratum: Dipole Moment And Potential Energy Functions Of The X ¹∑+ And A1∑+ States Of NaH. (The Journal Of Chemical Physics (1984) 80 (356))

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Recommended Citation

W. T. Zemke et al., "Erratum: Dipole Moment And Potential Energy Functions Of The X ¹∑+ And A1∑+ States Of NaH. (The Journal Of Chemical Physics (1984) 80 (356))," *The Journal of Chemical Physics*, vol. 85, no. 7, pp. 4209 - 4210, American Institute of Physics, Jan 1986.
The definitive version is available at https://doi.org/10.1063/1.451870

ERRATUM | OCTOBER 01 1986

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Erratum: Dipole moment and potential energy functions of the $X\,^1\Sigma^+$ and $A\,^1\Sigma^+$ states of NaH [J. Chem. Phys. 80, 356 (1984)]

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The previously reported lifetime values for all vibrational values of the $X\,^1\Sigma^+$ state of NaH (Table VI) and the dipole moment absorption matrix elements and Einstein A coefficients for the $X\,^1\Sigma^+ \rightarrow X\,^1\Sigma^+$ band in NaH (Table VIII) are in error. The reported $\mu_{v',J';v'',J''}$ values are actually for $v', J' = 1$ and $v'', J'' = 0$ quantum numbers; the desired values for $v', J' = 0$ and $v'', J'' = 1$ are listed below in the correct version of Table VIII. The reported lifetime values are 1%–6% too large; the correct values for $J'' = 1$ and $J' = 0$ quantum numbers are just $\tau_v = (A_{v',J'})^{-1} = (\Sigma_{v''} A_{v',J'=0;v'',J''=1})^{-1}$ and are listed below in a corrected version of Table VI. The reported expectation values of the dipole moment function are correct and not repeated here.

We are grateful to Dr. Stephen R. Langhoff of NASA Ames Research Center for pointing out our mistaken values.

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TABLE VI. Lifetimes τ_v for all vibrational levels of the $X\,^1\Sigma^+$ state of NaH.

Vibrational level v	τ_v (ms)
0	∞
1	27.35
2	14.66
3	10.47
4	8.424
5	7.211
6	6.412
7	5.840
8	5.392
9	5.013
10	4.667
11	4.333
12	4.007
13	3.695
14	3.438
15	3.275
16	3.247
17	3.383
18	3.742
19	4.541
20	7.144
21	17.64

TABLE VIII. Dipole moment absorption matrix elements $\mu_{v',J'=0;v'',J''=1}$ (e Å units, in upper right including pure rotational transitions on the diagonal) and Einstein A spontaneous emission coefficients $A_{v',J'=0;v'',J''=1}$ (in s^{-1} units, in lower left) for the $X\,^1\Sigma^+ \rightarrow X\,^1\Sigma^+$ bands in NaH. A coefficients are in exponential notation, e.g., 3.656(1) = 36.56.

	$v''(J''=1)$							
$v'(J'=0)$	0	1	2	3	4	5	6	7
0	1.337 804	0.056 764	−0.007 099	0.000 900	−0.000 181	0.000 043	−0.000 012	0.000 007
1	3.656(1)	1.359 904	0.078 993	−0.012 709	0.001 820	−0.000 414	0.000 116	−0.000 035
2	4.167(0)	6.405(1)	1.381 234	0.094 646	−0.018 625	0.002 913	−0.000 716	0.000 230
3	2.128(−1)	1.204(1)	8.322(1)	1.401 384	0.106 169	−0.025 015	0.004 229	−0.001 104
4	1.940(−2)	7.833(−1)	2.330(1)	9.461(1)	1.420 170	0.114 281	−0.031 950	0.005 766
5	2.034(−3)	9.134(−2)	1.803(0)	3.778(1)	9.901(1)	1.437 123	0.119 205	−0.039 492
6	2.759(−4)	1.343(−2)	2.456(−1)	3.408(0)	5.525(1)	9.704(1)	1.451 685	0.120 817
7	1.266(−4)	2.017(−3)	4.693(−2)	5.223(−1)	5.660(0)	7.536(1)	8.964(1)	1.463 316
8	1.157(−4)	5.005(−4)	1.045(−2)	1.157(−1)	9.393(−1)	8.701(0)	9.788(1)	7.780(1)
9	7.394(−5)	4.289(−4)	2.977(−3)	3.016(−2)	2.350(−1)	1.541(0)	1.269(1)	1.222(2)
10	2.703(−5)	5.779(−4)	1.416(−3)	9.773(−3)	7.211(−2)	4.194(−1)	2.359(0)	1.783(1)
11	8.728(−6)	5.905(−4)	1.206(−3)	4.785(−3)	2.618(−2)	1.427(−1)	6.878(−1)	3.398(0)
12	9.008(−6)	4.059(−4)	1.356(−3)	3.590(−3)	1.221(−2)	5.842(−2)	2.461(−1)	1.053(0)
13	2.168(−5)	2.004(−4)	1.480(−3)	3.310(−3)	8.142(−3)	2.790(−2)	1.065(−1)	3.953(−1)
14	4.121(−5)	8.863(−5)	1.351(−3)	3.162(−3)	7.014(−3)	1.606(−2)	5.417(−2)	1.734(−1)
15	5.099(−5)	5.464(−5)	9.992(−4)	2.918(−3)	6.365(−3)	1.163(−2)	3.108(−2)	8.883(−2)
16	4.317(−5)	5.711(−5)	6.188(−4)	2.507(−3)	5.471(−3)	9.868(−3)	1.989(−2)	5.189(−2)

 0021-9606/86/194209-02$02.10

TABLE VIII. (*continued*).

	$v''(J''=1)$							
$v'(J'=0)$	0	1	2	3	4	5	6	7
17	2.667(−5)	7.204(−5)	3.470(−4)	1.967(−3)	4.412(−3)	8.633(−3)	1.424(−2)	3.316(−2)
18	1.251(−5)	8.160(−5)	1.921(−4)	1.399(−3)	3.375(−3)	7.164(−3)	1.101(−2)	2.221(−2)
19	4.467(−6)	7.487(−5)	1.093(−4)	8.935(−4)	2.402(−3)	5.369(−3)	8.404(−3)	1.482(−2)
20	1.151(−6)	4.829(−5)	5.568(−5)	4.548(−4)	1.364(−3)	3.128(−3)	5.134(−3)	8.268(−3)
21	2.437(−7)	1.919(−5)	2.047(−5)	1.617(−4)	5.181(−4)	1.200(−3)	2.033(−3)	3.147(−3)

	$v''(J''=1)$						
$v'(J'=0)$	8	9	10	11	12	13	14
0	−0.000 006	0.000 004	−0.000 002	0.000 001	−0.000 001	0.000 001	−0.000 002
1	0.000 014	−0.000 011	0.000 011	−0.000 010	0.000 007	−0.000 005	0.000 003
2	−0.000 086	0.000 037	−0.000 022	0.000 017	−0.000 016	0.000 015	−0.000 013
3	0.000 382	−0.000 153	0.000 071	−0.000 042	0.000 032	−0.000 027	0.000 024
4	−0.001 569	0.000 578	−0.000 251	0.000 124	−0.000 072	0.000 051	−0.000 042
5	0.007 581	−0.002 134	0.000 820	−0.000 376	0.000 198	−0.000 116	0.000 077
6	−0.047 737	0.009 734	−0.002 812	0.001 121	−0.000 528	0.000 285	−0.000 173
7	0.118 787	−0.056 738	0.012 302	−0.003 607	0.001 484	−0.000 717	0.000 391
8	1.471 164	0.112 656	−0.066 516	0.015 418	−0.004 549	0.001 913	−0.000 945
9	6.277(1)	1.474 224	0.101 803	−0.077 036	0.019 239	−0.005 674	0.002 419
10	1.475(2)	4.609(1)	1.471 290	0.085 509	−0.088 127	0.023 931	−0.007 027
11	2.445(1)	1.725(2)	2.957(1)	1.460 904	0.063 116	−0.099 345	0.029 807
12	4.693(0)	3.299(1)	1.953(2)	1.526(1)	1.441 563	0.034 024	−0.109 859
13	1.515(0)	6.292(0)	4.391(1)	2.134(2)	4.985(0)	1.411 696	−0.003 093
14	5.930(−1)	2.076(0)	8.230(0)	5.797(1)	2.216(2)	1.821(−1)	1.368 399
15	2.661(−1)	8.391(−1)	2.749(0)	1.071(1)	7.736(1)	2.111(2)	2.152(0)
16	1.358(−1)	3.842(−1)	1.163(0)	3.530(0)	1.454(1)	1.044(2)	1.730(2)
17	7.735(−2)	2.008(−1)	5.388(−1)	1.591(0)	4.452(0)	2.238(1)	1.339(2)
18	4.811(−2)	1.147(−1)	2.783(−1)	7.686(−1)	2.111(0)	5.881(0)	3.915(1)
19	3.080(−2)	6.710(−2)	1.543(−1)	3.874(−1)	1.069(0)	2.528(0)	1.001(1)
20	1.674(−2)	3.394(−2)	7.631(−2)	1.773(−1)	4.724(−1)	1.165(0)	2.988(0)
21	6.278(−3)	1.228(−2)	2.735(−2)	6.113(−2)	1.583(−1)	4.044(−1)	8.863(−1)

	$v''(J''=1)$						
$v'(J'=0)$	15	16	17	18	19	20	21
0	0.000 002	−0.000 002	0.000 001	−0.000 001	00.000 000	0.000 000	0.000 000
1	−0.000 002	0.000 002	−0.000 002	0.000 002	−0.000 002	0.000 002	−0.000 001
2	0.000 010	−0.000 008	0.000 005	−0.000 004	0.000 003	−0.000 002	0.000 001
3	−0.000 021	0.000 018	−0.000 015	0.000 012	−0.000 009	0.000 006	−0.000 004
4	0.000 036	−0.000 030	0.000 025	−0.000 021	0.000 017	−0.000 012	0.000 007
5	−0.000 058	0.000 048	−0.000 042	0.000 035	−0.000 029	0.000 021	−0.000 013
6	0.000 115	−0.000 082	0.000 063	−0.000 051	0.000 042	−0.000 032	0.000 019
7	−0.000 239	0.000 160	−0.000 115	0.000 087	−0.000 066	0.000 047	−0.000 028
8	0.000 524	−0.000 321	0.000 215	−0.000 154	0.000 114	−0.000 080	0.000 047
9	−0.001 220	0.000 688	−0.000 431	0.000 291	−0.000 204	0.000 137	−0.000 079
10	0.003 032	−0.001 576	0.000 903	−0.000 567	0.000 382	−0.000 250	0.000 144
11	−0.008 765	0.003 792	−0.002 058	0.001 217	−0.000 766	0.000 478	−0.000 269
12	0.037 747	−0.011 342	0.004 795	−0.002 702	0.001 662	−0.001 003	0.000 552
13	−0.118 091	0.049 019	−0.016 000	0.006 379	−0.003 484	0.002 098	−0.001 164
14	−0.050 398	−0.120 544	0.063 842	−0.024 789	0.009 994	−0.004 713	0.002 383
15	1.306 592	−0.109 080	−0.111 635	0.079 172	−0.038 759	0.017 751	−0.008 315
16	1.069(1)	1.220 066	−0.177 286	−0.084 206	0.086 358	−0.051 549	0.026 512
17	1.105(2)	2.187(1)	1.104 408	−0.247 540	−0.030 641	0.065 434	−0.043 093
18	1.455(2)	4.472(1)	2.861(1)	0.956 879	−0.305 700	0.052 371	0.002 097
19	6.438(1)	1.120(2)	4.871(0)	2.470(1)	0.767 251	−0.317 615	0.125 547
20	1.960(1)	6.681(1)	3.584(1)	2.817(0)	9.963(0)	0.490 071	−0.229 605
21	5.138(0)	2.241(1)	2.155(1)	1.258(−1)	5.210(0)	6.858(−1)	0.195 436