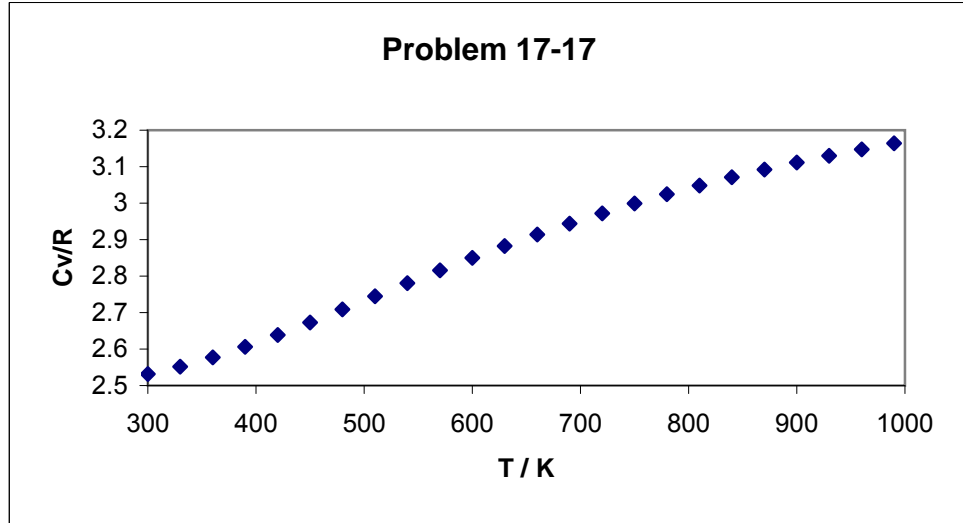


Problem 17-17

$h\nu/k_B = 2240 \text{ K}$

T	Cv/R
300	2.531917
330	2.552061
360	2.577151
390	2.606352
420	2.638664
450	2.673083
480	2.708695
510	2.744727
540	2.780555
570	2.815704
600	2.849825
630	2.882675
660	2.914099
690	2.944008
720	2.972365
750	2.999172
780	3.024455
810	3.048261
840	3.070651
870	3.091691
900	3.111454
930	3.130011
960	3.147437
990	3.163801



Problem 18-11

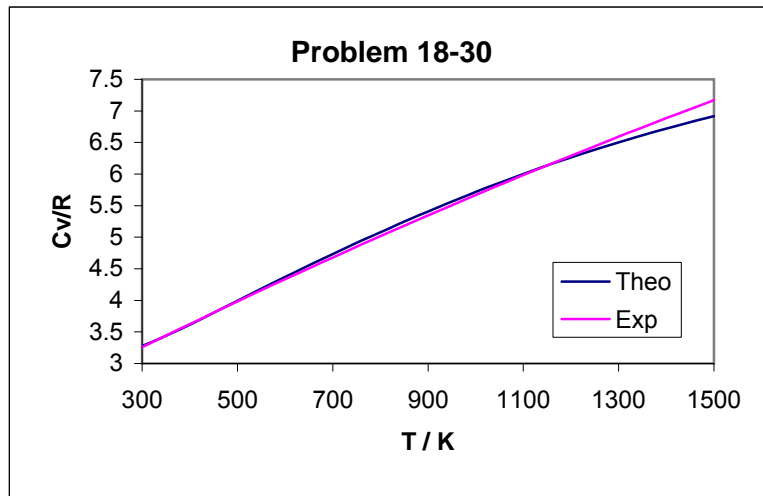
Molecule	$\theta_{\text{vib}} / \text{K}$	f_0	$f_{v>0}$
H ₂	6332	1.000000	6.8154E-10
D ₂	4394	1.000000	4.35545E-07
Cl ₂	805	0.931665	0.068334991
Br ₂	463	0.786332	0.213667687
I ₂	308	0.641801	0.358198969
O ₂	2256	0.999458	0.000542133
N ₂	3374	0.999987	1.30507E-05
CO	3103	0.999968	3.22068E-05
NO	2719	0.999884	0.000115836
HCl	4227	0.999999	7.5996E-07
HBr	3787	0.999997	3.29425E-06
HI	3266	0.999981	1.8706E-05
Na ₂	229	0.533890	0.466110134
K ₂	133	0.358107	0.641893207

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Problem 18-30

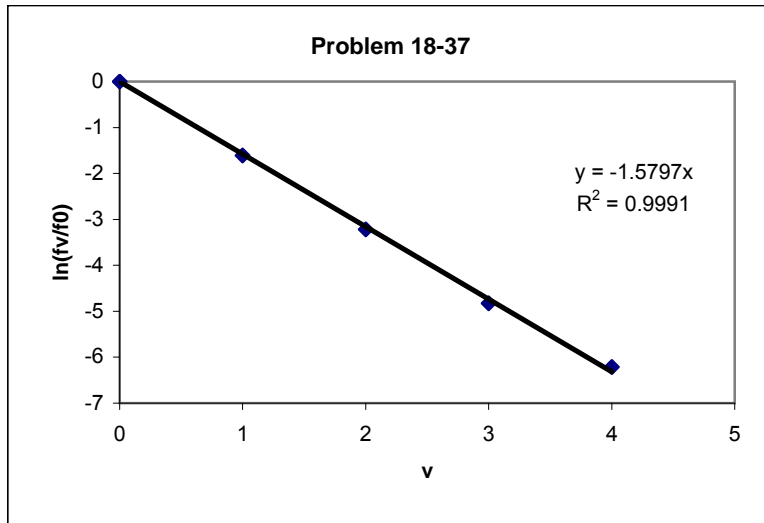
$\theta_{vib,1} = 4800 \text{ K}$
 $\theta_{vib,2} = 1360 \text{ K}$
 $\theta_{vib,3} = 4880 \text{ K}$
 $\theta_{vib,4} = 4880 \text{ K}$
 $\theta_{vib,5} = 2330 \text{ K}$
 $\theta_{vib,6} = 2330 \text{ K}$

T / K	Cv/R, Theo	Cv/R, Emp
300	3.276865	3.25776
340	3.4039031	3.4051504
380	3.5437589	3.5513696
420	3.6913004	3.6964176
460	3.8425628	3.8402944
500	3.9948055	3.983
540	4.14633	4.1245344
580	4.296195	4.2648976
620	4.4439364	4.4040896
660	4.5893465	4.5421104
700	4.7323255	4.67896
740	4.8727947	4.8146384
780	5.0106568	4.9491456
820	5.1457841	5.0824816
860	5.2780233	5.2146464
900	5.4072073	5.34564
940	5.533168	5.4754624
980	5.6557482	5.6041136
1020	5.7748101	5.7315936
1060	5.8902414	5.8579024
1100	6.0019583	5.98304
1140	6.1099065	6.1070064
1180	6.2140602	6.2298016
1220	6.3144203	6.3514256
1260	6.4110119	6.4718784
1300	6.5038811	6.59116
1340	6.593092	6.7092704
1380	6.6787234	6.8262096
1420	6.7608664	6.9419776
1460	6.8396212	7.0565744
1500	6.9150951	7.17



Problem 18-37

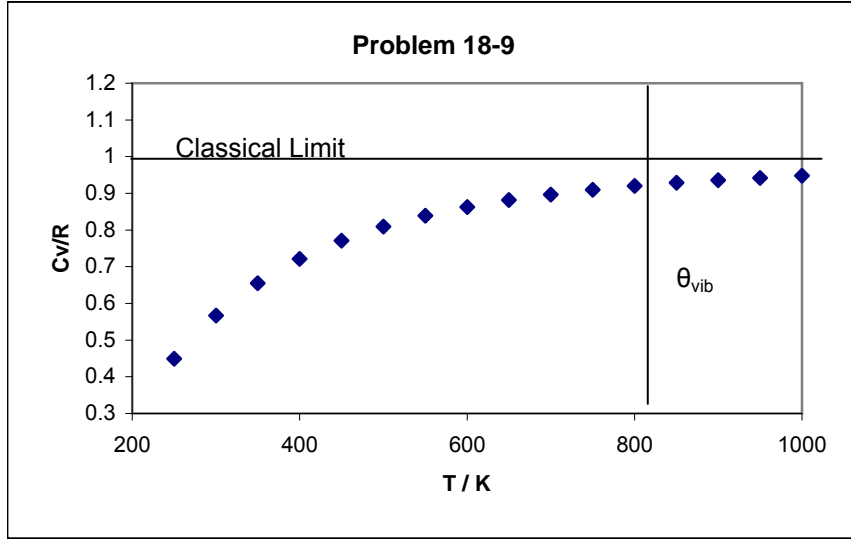
v	f_v/f_0	$\ln(f_v/f_0)$
0	1	0
1	0.2	-1.609438
2	0.04	-3.218876
3	0.008	-4.828314
4	0.002	-6.214608



Problem 18-9

$\theta_{\text{vib}} / \text{K}$ 805

T	Cv/R
250	0.44947
300	0.566856
350	0.655154
400	0.721226
450	0.771124
500	0.809349
550	0.839091
600	0.862588
650	0.88142
700	0.896714
750	0.909283
800	0.919728
850	0.928493
900	0.935915
950	0.942252
1000	0.947704



Problem 18-17

$\theta_{\text{rot}} / \text{K}$ 2.39

J	f_J at 300K	f_J at 1000K
0	0.007967	0.00239
2	0.037974	0.01178
4	0.061139	0.020506
6	0.074115	0.028103
8	0.076316	0.034207
10	0.069648	0.038587
12	0.057475	0.041154
14	0.043361	0.041959
16	0.030109	0.04117
18	0.019329	0.03905
20	0.011506	0.035912
22	0.006365	0.032092
24	0.003278	0.027914
26	0.001573	0.02366
28	0.000704	0.019563
30	0.000294	0.015791
32	0.000115	0.012451
34	4.2E-05	0.009596
36	1.43E-05	0.00723
38	4.57E-06	0.005329
40	1.37E-06	0.003843
42	3.82E-07	0.002712

