Erratum: Magnetic Susceptibilities of Uranium (IV) and Plutonium (IV) Ions in Cubic Fields*

[J. Chem. Phys. **30**, 246 (1959)]

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THE asterisk referred to the following footnote:

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Errata: Bending Motions in the Dihalides of Group II Metals

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THE statement on page 286 at the end of Sec. II, "The constant of proportionality so defined is simply half of the usual bending constant k_δ/l^2." is incorrect. The correct statement should read "The constant of proportionality so defined is equal to the usual bending constant k_δ/l^2." Accordingly, Eq. (1) should read

$$2k_\delta/l^2=k^{(0)}+k^{(1)}+k^{(2)}+k^{(3)}+k^{(3)\prime}+\cdots. \quad (1')$$

The last column of Table II should be headed $2k_\delta/l^2$, and the values in the column k_δ/l^2 (calc) of Table III are all in error, being too large by a factor of 2.

The author would like to thank Mr. Alfred Büchler for pointing out this error.

Errata: Diffusion and Heterogeneous Reaction. II. Catalytic Activity of Solids for Hydrogen-Atom Recombination

[J. Chem. Phys. **29**, 1416 (1958)]

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IT should be noted that the pressures involved in these experiments were in the region below 2×10^{-2} mm Hg and not 2×10^{-3} mm Hg as stated in the first paragraph of the communication.

Reference 2 should read, "H. Wise and C. M. Ablow, J. Chem. Phys. **29**, 634 (1958)."

Notes

Thomas-Fermi Model for Diatomic Hydrides

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IN this paper, assuming the Thomas-Fermi method,[1] we have calculated numerically, using the accurate Kobayashi and Taima table[2] for the Thomas-Fermi function φ_0 and φ_0', the number of free electrons N, force constants k_e, and the molar diamagnetic susceptibilities χ of the diamagnetic hydrides. As known[3] for N and k_e, we have following formula:

$$N=Z_u[\varphi_0(x_e)-x_e\varphi_0'(x_e)],$$

$$k_e=7.1915\times10^5\left[\frac{Z_u\varphi_0(x_e)}{r_e}\right]^{3/2}. \quad (1)$$

The internuclear equilibrium distance r_e is given in Angstroms and x_e is related to r_e by $x_e=Z_u^{1/3}r_e/0.4683$, where Z_u is the nuclear charge of the united atom.

In Table I we have collected our results for N and k_e in 10^5 dynes/cm. Table I gives a comparison of our results for k: with observed k_e and calculated k_e by Platt[4] who used the Slater functions. Our results for N are better than those of Varshni[3] by about 6%.

The results of Table I for N agree well with the results of Braunbek[5] as also of Fajans and Bauer.[6] Using the formula of Gombàs[7] for χ,

$$\chi=-9.43[1-3.01N/Z_u+3.92(N/Z_u)^2][(Z_u-N)/Z_u^{2/3}]\times10^{-6}\ \text{cm}^3, \quad (2)$$

we have in Fig. 1 $-\chi\times10^6$ as a function of Z_u.

For such diatomic hydrides as are paramagnetic we can use the formula given by Landau[8] $\kappa=1.47\times$

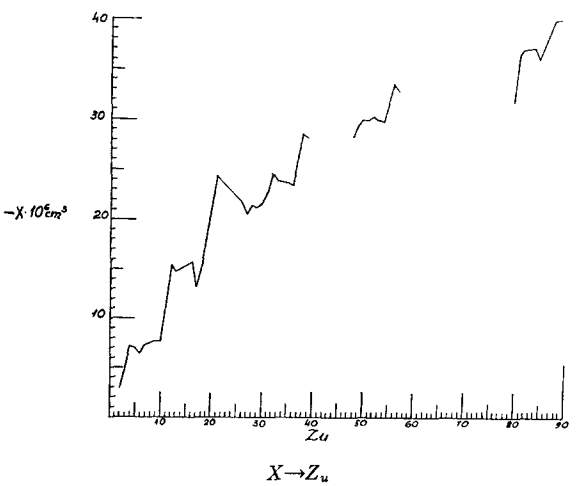

FIG. 1. $-\chi\times10^6$ cm^3 of the united atom as a function of the nuclear charge $Z_u(=Z+1)$.

TABLE I. The number of electrons (N) for diatomic hydrides outside r_e and the force constants k_e.[a]

Group	Diatom	Z_u	r_e	$\varphi_0(x_e)$	$-\varphi_0'(x_e)$	k_e Observed and estimated	k_e Platt (Slater)	N Our results	N Our results
	H_2	2	0.7417	0.24360	0.11867	5.734	5.21	3.82857	0.96069
1a	LiH	4	1.595	0.069961	0.019938	1.026	0.93	0.52851	0.71114
	NaH	12	1.887	0.028269	0.0056653	0.781	0.72	0.54815	0.96644
	KH	20	2.244	0.014504	0.0022658	0.5614	0.38	0.33424	0.87964
	RbH	38	2.376	0.0082833	0.0010548	0.5148	0.26	0.35126	0.99577
	CsH	56	2.494	0.0055513	0.00061254	0.467	0.20	0.31648	1.00961
	FrH	88	2.57_eS_3	0.0036721	0.00034952	...	...	0.32064	1.07394
1b	CuH	30	1.463	0.025716	0.0049722	2.20	1.61	2.75585	2.21943
	AgH	48	1.617	0.015598	0.0025040	1.822	1.98	2.26579	2.25711
	AuH	80	1.538	0.019418	0.0033792	3.138	4.85	7.30009	4.59202
2a	BeH	5	1.343	0.081091	0.024526	2.263	2.01	1.19294	1.00696
	MgH	13	1.731	0.031533	0.0065864	1.274	1.35	0.82592	1.15417
	CaH	21	2.002	0.017347	0.0028973	0.977	0.81	0.55818	1.08832
	SrH	39	2.145	0.010042	0.0013712	0.854	0.52	0.56106	1.22213
	BaH	57	2.234	0.0070104	0.00084074	0.809	0.37	0.54403	1.27849
	RaH	89	2.31_eS_3	0.0039705	0.00038859	...	...	0.43028	1.16957
2b	ZnH	31	1.594	0.021416	0.0038644	1.511	1.99	1.93302	1.94452
	CdH	49	1.762	0.012912	0.0019330	1.204	1.81	1.54737	1.93694
	HgH	81	1.740	0.0093235	0.0012936	1.137	2.18	2.05624	2.36976
3b	BH	6	1.232	0.084234	0.025880	(3.044)	2.65	1.88956	1.24764
	AlH	14	1.646	0.33042	0.0070266	1.62	1.84	1.07185	1.29580
	GaH	32	1.72_eS_3	0.018062	0.0030621	1.42_eS_3	...	1.40093	1.72051
	InH	50	1.838	0.011684	0.0016865	1.28	...	1.28867	1.80270
	TlH	82	1.87	0.0079142	0.00099168	1.142	1.76	1.47024	2.05983
4b	CH	7	1.12	0.089785	0.028314	4.482	3.35	3.02305	1.53525
	SiH	15	1.52	0.036482	0.0080571	(2.479)	2.58	1.55349	1.51565
	GeH	33	1.66_eS_3	0.18978	0.0032778	1.87_eS_3	...	1.66650	1.85614
	SnH	51	[1.785]	0.012222	0.0017940	(1.469)	...	1.48399	1.91705
	PbH	83	1.819	0.0081361	0.0010298	1.445	...	1.62672	2.13946
5b	NH	8	1.038	0.093938	0.030178	(6.03)	3.82	4.43017	1.82174
	PH	16	[1.433]	0.039032	0.0088469	(3.257)	3.01	2.06900	1.71601
	AsH	34	1.58_eS_3	0.020501	0.0036431	2.43_eS_3	...	2.10725	2.05088
	SbH	52	1.76_eS_3	0.012423	0.0018337	2.05_eS_3	...	1.59917	1.98379
	BiH	84	1.809	0.0083676	0.0010698	1.706	2.49	1.74174	2.22247
6b	OH	9	0.971	0.098717	0.032368	$7.792L_3$	4.17	6.29423	2.13527
	SH	17	[1.35]	0.041811	0.097333	$4.193L_3$	3.51	2.74744	1.93371
	SeH	35	1.50_eS_3	0.022236	0.0040714	3.18_eS_3	...	2.68763	2.27165
	TeH	53	1.69_eS_3	0.013326	0.0020188	2.53_eS_3	...	1.94291	2.15715
	PoH	85	1.77_eS_3	0.0086848	0.0011256	2.1_eS_3	...	1.93699	2.32834
7a	MnH	26	1.731	0.020429	0.0036250	[1.295]	1.80	1.22238	1.56319
7b	FH	10	0.9171	0.10072	0.033300	9.655	4.22	8.27691	2.41215
	ClH	18	1.275	0.044613	0.010650	5.157	4.30	3.59464	2.17101
	BrH	36	1.414	0.024452	0.0046395	4.117	4.27	3.53241	2.54548
	IH	54	1.604	0.014641	0.0022956	3.142	3.06	2.48863	2.39593
	AtH	86	1.68_eS_3	0.0096404	0.0012975	2.7_eS_3	...	2.45313	2.59546
8	FeH	27	[1.476]	0.027005	0.0053197	...	2.12	2.49690	2.08732
	CoH	28	1.542	0.024314	0.0046029	(2.084)	1.55	2.10967	1.96960
	NiH	29	1.475	0.025851	0.0050088	(2.166)	1.64	2.71922	2.15575

[a] e=estimated value. L_3=S. Leach, J. Chem. Phys. **22**, 1261 (1954). S_3=R. K. Sheline, J. Chem. Phys. **18**, 927 (1950). Force constants of GaH and AtH have been estimated by Varshni (see reference 3).

$10^{-14}N^{1/3}$, where κ is the volume susceptibility. Figure 1 does not give a comparison with experimental data for χ since such experimental results are unknown in most cases.

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[2] S. Kobayashi and T. Taima, Mem. Fac. Liberal Arts Educ. Kagawa Univ. Part II, No. 33 (1957).
[3] Y. Pal. Varshni, Ann. Physik **19**, 233 (1956); and T. Tietz, Nuovo cimento **6**, 387 (1957).
[4] J. R. Platt, J. Chem. Phys. **18**, 932 (1950).
[5] W. Braunbek, Z. Physik **79**, 701 (1932).
[6] K. Fajans and N. Bauer, J. Chem. Phys. **10**, 410 (1942).
[7] P. Gombàs, Z. Physik **87**, 57 (1933).
[8] For reference see N. C. Stoner, *Magnetism* (Methuen and Company, London, 1946).