from the relative abundance values equal importance: this result is in agreement with occuring in a much more important fraction of the ions into account, it may be assumed that dissociation and Lindholm’s observation with charge exchange for CH₄ column 2). Taking the above-mentioned corrections lost in the tube (4%) than would appear at first sight.

It was suggested that creation of sites l-4 can occur by chemisorption reactions by gaseous electrodeless discharges (see reference 1). . .

Possibility of Enhanced Catalytic Reactions

MANFRED J. D. LOW

Wm. H. Nichols Laboratory, New York University, New York 53, New York

(Received July 31, 1957)

I n a recent paper1 we have described experiments on the enhancement of rate and extent of gas-solid chemisorption reactions by gaseous electrodeless discharges, and have postulated a general mechanism. It was suggested that creation of sites1-4 can occur by a chain mechanism initiated by the reaction of an active particle G, with a surface atom S, causing a “disso-

<table>
<thead>
<tr>
<th>Process</th>
<th>Relative abundance</th>
<th>( Q_{4e}^{+})</th>
</tr>
</thead>
<tbody>
<tr>
<td>( CH_4^+ )</td>
<td>0.05</td>
<td>( 5d )</td>
</tr>
<tr>
<td>( CH_2^+ )</td>
<td>0.008</td>
<td>0.74</td>
</tr>
<tr>
<td>( CH^+ )</td>
<td>0.001</td>
<td>0.096</td>
</tr>
<tr>
<td>( C^+ )</td>
<td>0.0003</td>
<td>0.033</td>
</tr>
<tr>
<td>( CH_4^+ )</td>
<td>0.0074</td>
<td>( 0.7d )</td>
</tr>
<tr>
<td>( CH^+ )</td>
<td>0.0025</td>
<td>0.31</td>
</tr>
<tr>
<td>( C^+ )</td>
<td>0.0004</td>
<td>0.057</td>
</tr>
<tr>
<td>( CH_2^+ )</td>
<td>( \ldots )</td>
<td>( \ldots )</td>
</tr>
<tr>
<td>( CH^+ )</td>
<td>( \ldots )</td>
<td>( (0.12)^\ast )</td>
</tr>
<tr>
<td>( C^+ )</td>
<td>( \ldots )</td>
<td>( (0.42)^\ast )</td>
</tr>
</tbody>
</table>

* All figures in this table are obtained from the measured peak heights. 
\( n \) Abundance relative to the primary ion intensities of \( CH_4^+ \) and \( CH_2^+ \), equal 100 respectively. 
\( \ast \) In units cm³/(cm³/mm Hg). 
\( \ast \) Estimated from relative abundance of this ion according to Rosenstock+Melton’s data.

\( 2 H. A. Taylor and N. Thon, J. Am. Chern. Soc. 74, 4169 (1952). \)
\( 4 H. A. Taylor, Peter C. Reilly Lectures, Notre Dame University (to be published). \)

Errata: Raman Spectra, Vibrational Assignments, and Force Constants for BH₂CO and BD₂CO

[J. Chem. Phys. 26, 1131 (1957)]

ROBERT C. TAYLOR

Department of Chemistry, University of Michigan, Ann Arbor, Michigan

T he \( A_1 \) symmetry coordinates in the above paper formed from the valence angles around the boron atom would be of the correct form only if the angles were tetrahedral. Since this is not the case for BH₂CO, the redundancy condition (as expressed by the \( S_0 \) symmetry coordinate) should be written as \( S_0 = (3+3\alpha)^{-1} \)

\[ \chi[\Delta_1 \Delta_2 \Delta_3 + \alpha(\Delta_1 + \Delta_2 + \Delta_3)] = 0. \]
The corresponding nonredundant coordinate, $S_4$, should be

$$S_4 = (3 + 3a^2)^{-1} \left[ \Delta \alpha_{12} + \Delta \alpha_{23} + \Delta \alpha_{31} - a \left( \Delta \beta_1 + \Delta \beta_2 + \Delta \beta_3 \right) \right]$$

where

$$\frac{\sqrt{3} \cos \beta}{a} = \frac{\cos \alpha}{\cos \frac{\alpha}{2}}.$$

Incorporation of these changes in the normal coordinate treatment leads to revised values for certain force constants as listed below. The agreement between calculated and experimental frequencies is unchanged. The author is indebted to Mr. James Scherer for first bringing this point to his attention.

<table>
<thead>
<tr>
<th>$F_1$</th>
<th>$17.9900$ md/A</th>
<th>$k_1$</th>
<th>$17.9900$ md/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F_2$</td>
<td>$2.7750$</td>
<td>$k_R$</td>
<td>$2.7750$</td>
</tr>
<tr>
<td>$F_3$</td>
<td>$0.5230$</td>
<td>$k_a$</td>
<td>$0.2125$</td>
</tr>
<tr>
<td>$F_{24}$</td>
<td>$-0.2790$</td>
<td>$k_{as}$</td>
<td>$-0.0309$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$k_{ba}$</td>
<td>$0.0048$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$k_{ab} = k_{ba}'$</td>
<td>$-0.0627$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$k_{Ra}$</td>
<td>$-0.0670$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$k_{Rs}$</td>
<td>$0.0836$</td>
</tr>
</tbody>
</table>

*(r' ≠ r). In contradiction to the statements in the article, $P_4(r,r') = 0$. Thus in this approximation all matrix elements of $P_c$ and $P_s$ vanish in all equations in the article, thereby simplifying the results considerably.*

If the rotor is nearly symmetric, the separation between “asymmetry doublets” becomes small, and condition (d) no longer holds. In this event degenerate perturbation theory must be applied. The wave equation described in Eq. (13) should be altered by substituting $2^{-1} [\Phi_m \pm \Phi_n]$ in place of $\Phi_n$, where $(r0)$ and $(r1)$ represent the rigid rotor quantum numbers corresponding to the $\gamma = 0$ and $\gamma = 1$ members, respectively, of an “asymmetry doublet.” Thus if the inequality in relation (d) is reversed, the equations throughout the article must be altered in the following ways: $W_R(r)$, $(r|P_s^*|r)$, and $(r|P_s^c|r)$ should all be replaced by the average of the corresponding $(r0)$ and $(r1)$ values; $(r|P_s^c|r)$ should be replaced by $(+) r(r0)|P_s^c|r1)$ where the $(+)$ and $(-)$ refer to the two different states corresponding to the same limiting quantum number $K$; $(r|P_s^c|r)$ should be treated analogously to $(r|P_s^c|r)$. For a symmetric top, this procedure leads to Eq. (43), except that $\pm K$ should be substituted for $K$.

The author is greatly indebted to Mr. Dudley Herschbach for his criticisms of Appendix III which led to the present revisions.


---

Addendum: Theory of Internal Over-All Rotational Interactions. III. Nonrigid Asymmetric Rotors

[J. Chem. Phys. 23, 2236 (1955)]

Daniel Kivelson

Department of Chemistry, University of California, Los Angeles, California

Because of symmetry considerations, the matrix elements $(r|P^s|r)$ and $(r|P^c|r)$ appearing in the article are equal to zero. Thus all discussions pertaining to the evaluation of these elements, i.e., Appendix III, should be ignored. The following discussion should be added in order to correct the article. The matrix elements

\begin{align*}
P_c(r',r) &= 1/2 (I_2/I_1 I_2) (r'|P^c_2|r) \quad (a) \\
P^s(r',r) &= I_1^{-1} (r'|P^s_2|r) \quad (b)
\end{align*}

appear in Eq. (17) but only $(r,r)$ terms are retained, an approximation that is valid provided

\begin{align*}
|P_c(r',r)| &\ll |W_r - W_r + P_3(r',r') - P_3(r,r)| \quad (c) \\
|P^s(r',r)| &\ll |W_r - W_r + P_3(r',r') - P_3(r,r)| \quad (d)
\end{align*}

Errata: Theory of the Interaction of Internal Rotation with Over-All Rotations.

I. Symmetric Rotors: Methyl Silane

[J. Chem. Phys. 22, 1733 (1954)]

Daniel Kivelson

Department of Chemistry, University of California, Los Angeles, California

In the abstract, and in Eqs. (14) and (16), $K$ should be replaced by $\pm K$. See the preceding errata for a discussion of this procedure.

Erratum: Statistical Mechanics of Liquid-Vapor Equilibrium

[J. Chem. Phys. 26, 887 (1957)]

B. Widom

Department of Chemistry, Cornell University, Ithaca, New York

This article should contain a reference to the earlier work of S. Katsura and H. Fujita [Progr. Theoret. Phys. Japan 5, 997 (1950)], to which it is quite closely related, and in which some of the methods of the present paper were anticipated.