Copy of a printed table referenced as "Heryberg table 14" [possibly variation on Herzberg]

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easily be verified by the reader with the help of Table 14. Unfortunately the designation in this case is not unambiguous, since any one of the three C_2's may be chosen as z axis. In the figures the z axis has been assumed to be perpendicular to the plane of the molecule and the x axis in the line X—X. It is seen that there are three

TABLE 14. SYMMETRY TYPES (SPECIES) FOR THE POINT GROUP $D_{2h} \equiv V_h$.

$D_{2h} \equiv V_h$	I	$\sigma(xy)$	$\sigma(xz)$	$\sigma(yz)$	i	$C_2(z)$	$C_2(y)$	$C_2(x)$	
A_g	+1	+1	+1	+1	+1	+1	+1	+1	
A_u	+1	−1	−1	−1	−1	+1	+1	+1	
B_{1g}	+1	+1	−1	−1	+1	+1	−1	−1	R_z
B_{1u}	+1	−1	+1	+1	−1	+1	−1	−1	T_z
B_{2g}	+1	−1	+1	−1	+1	−1	+1	−1	R_y
B_{2u}	+1	+1	−1	+1	−1	−1	+1	−1	T_y
B_{3g}	+1	−1	−1	+1	+1	−1	−1	+1	R_x
B_{3u}	+1	+1	+1	−1	−1	−1	−1	+1	T_x

totally symmetric vibrations (species A_g) and that there are one or two of each of the other species with the exception of B_{3g}. The reason why there is no vibration of this species, and also the determination of the number of vibrations of each of the other species, will be explained in the next section. There may, however, be eigenfunctions of the species B_{3g}.

Degenerate symmetry types. As mentioned before, in a molecule having at least one more-than-two-fold axis we have always degenerate as well as non-degenerate normal vibrations (eigenfunctions). In this case, in addition to symmetry types similar to the above, we have one or more *degenerate symmetry types* (*species*) usually designated by E if doubly degenerate and by F if triply degenerate.[13] While the influence of the various symmetry operations on the non-degenerate vibrations or eigenfunctions can be simply characterized by +1 or −1, such cannot be done with the degenerate vibrations and eigenfunctions, since in general they go over into a linear combination according to the previous equation (II, 62). It can be shown that it is sufficient for the characterization of the behavior of a degenerate vibration or eigenfunction *to give for every symmetry operation the value of the sum*

$$\chi = d_{aa} + d_{bb} + \cdots \qquad \text{(II, 85)}$$

the coefficients with two equal subscripts in the equations (II, 62). In group