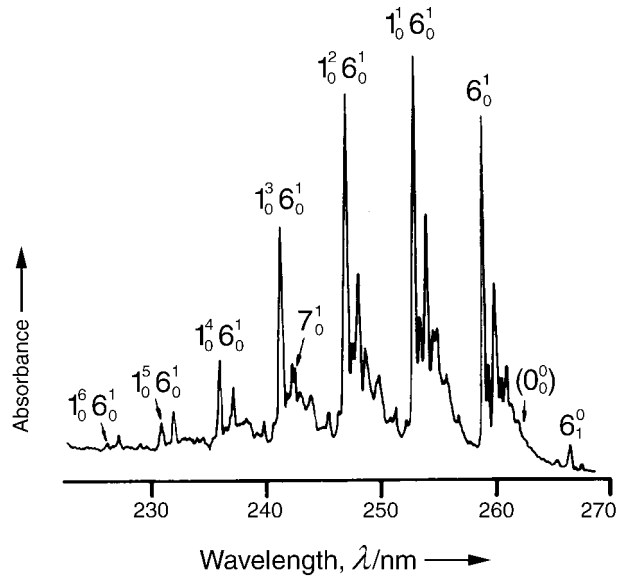

Figure 7.42 Low-resolution $\tilde{A}^1B_{2u} - \tilde{X}^1A_{1g}$ absorption spectrum of benzene

chlorobenzene in the C_{2v} point group for which the ground state is $^1A_1$ and an excited electronic state is $^1B_2$. If one quantum of a b_2 vibration X is excited in the upper electronic state and no vibration at all is excited in the lower electronic state Equation (7.126) becomes

$$\begin{aligned}\Gamma(\psi_e') \times \Gamma(\psi_v') \times \Gamma(\psi_e'') \times \Gamma(\psi_v'') &= B_2 \times B_2 \times A_1 \times A_1 \\ &= A_1 = \Gamma(T_z) \end{aligned} \tag{7.127}$$

The vibronic transition X_0^1, together with X_1^0 in which the same b_2 vibration is excited only in the lower state, are illustrated in Figure 7.43. Both vibronic transitions are allowed and are

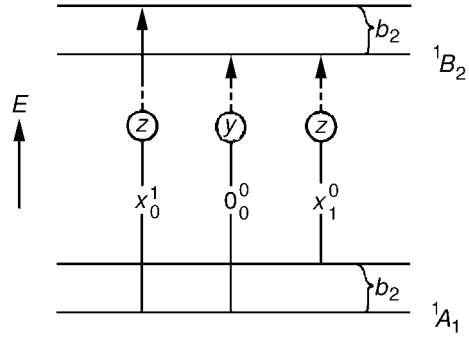

Figure 7.43 Some allowed electronic and vibronic transitions in a C_{2v} molecule