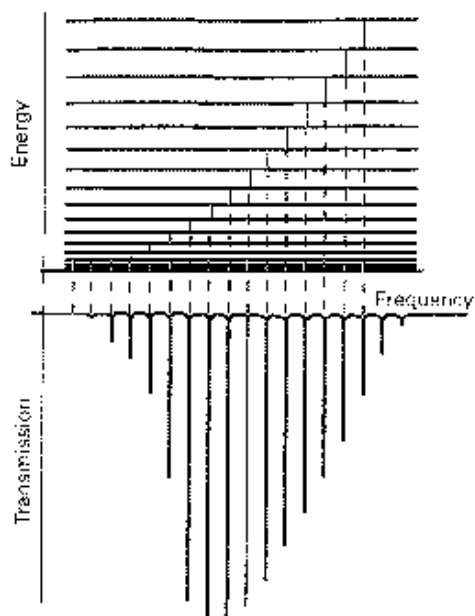
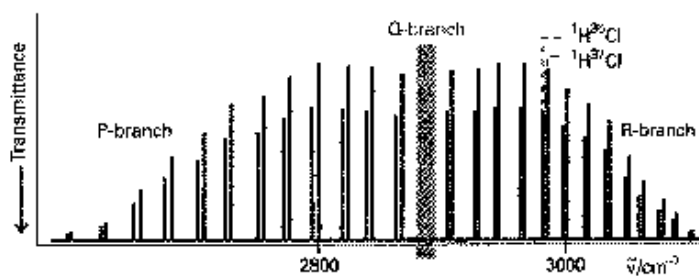


16.26 The rotational energy levels of a linear rotor, the transitions allowed by the selection rule $\Delta J = \pm 1$, and a typical pure rotational absorption spectrum. The intensities reflect the populations of the initial level in each case and the strengths of the transition dipole moments



For a typical molecule (for example, OCS, with $B = 0.2$ temperature, $kT \approx 1000hcB$, so $J_{\max} \approx 20$).

16.41 A high-resolution vibration-rotation spectrum of HCl . The lines appear in pairs because $^1\text{H}^{35}\text{Cl}$ and $^1\text{H}^{37}\text{Cl}$ both contribute (their abundance ratio is 3:1). There is no Q branch, because $\Delta J = 0$ is forbidden for this molecule.



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by Peter Atkins, W.H. Freeman, N.Y.,
pp. 564 and 574

