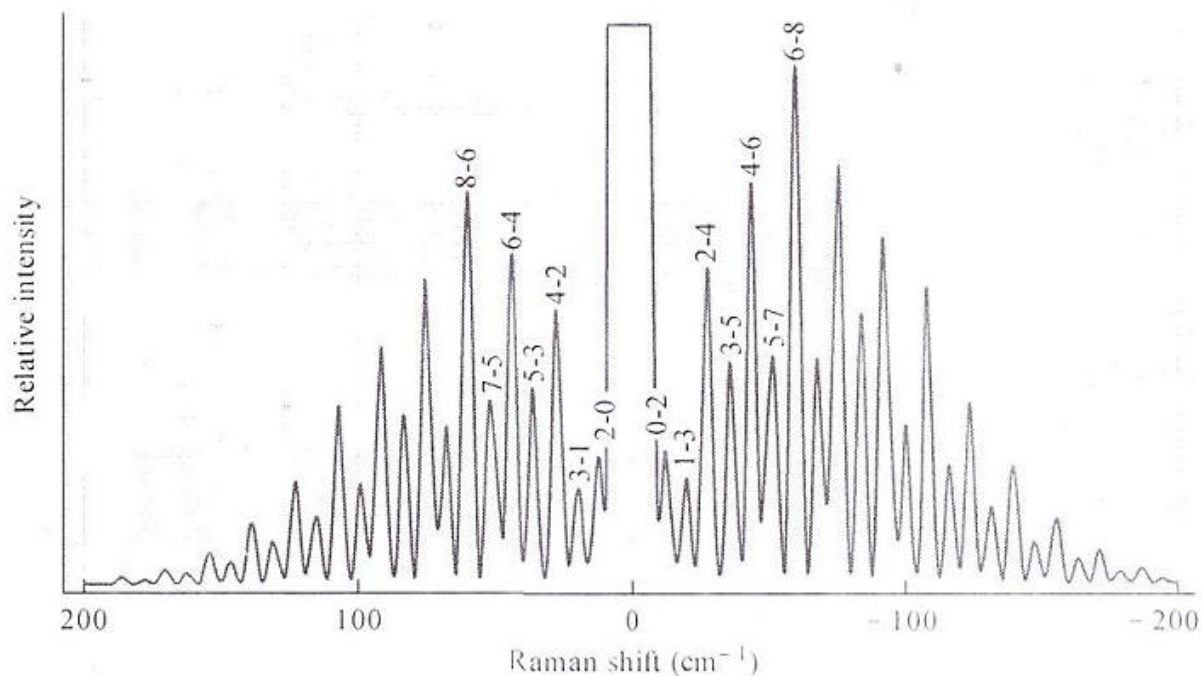


Answer on Question #67831, Chemistry / General Chemistry

Explain the rotational Raman spectrum of $^{14}\text{N}_2$ with the help of a suitable diagram.

Solution:



The figure shows the pure rotational Raman spectrum of N_2 . The Stokes lines appear as the envelope on the right, with negative Raman shifts, and anti-Stokes lines appear as the envelope on the left, with positive Raman shifts. The overall shape of the envelopes is determined by the degeneracy of the levels and the Boltzmann factor. Notice the interesting alternating intensities of the lines in the spectrum, which results from the effects of nuclear spin. The pattern seen in the Figure arises because ^{14}N has a nuclear spin of one.

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