We use infrared spectroscopy to observe the quantum dynamics of molecular hydrogen trapped within the interstitial sites of the C\textsubscript{60} lattice. These spectra form the first observation of infrared activity induced by the C\textsubscript{60} intermolecular potential. They also reveal the first evidence for distinct side-bands (at +/- 127 cm\textsuperscript{-1}) associated with the translational motion of the trapped species. On exposure of C\textsubscript{60} to high pressure H\textsubscript{2} the induced modes grow in intensity over the course of a few hours as the H\textsubscript{2} slowly diffuses into the octahedral interstitial sites. Despite the fact that the fundamental H\textsubscript{2} vibrational mode occurs highly red-shifted (54 cm\textsuperscript{-1}) relative to the gas phase the location of the rotational side-bands indicates almost complete rotational freedom of the trapped H\textsubscript{2}. Most surprisingly the spectra contain weak central zero-phonon modes which should not be activated by a potential with true octahedral symmetry. These zero-phonon modes show a sudden decrease in intensity on cooling through the C\textsubscript{60} orientational phase transition at 260 K. We speculate that this may be the result of freezing out of a quasi fluid like surface layer within the C\textsubscript{60} lattice.

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