INFRARED DIODE LASER SPECTROSCOPY OF THE P=O (ν_2) FUNDAMENTAL BAND OF *CIS*-HOPO

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The P=O (ν_2) stretching fundamental of the transient molecule *cis*-HOPO has been measured using high resolution infrared diode laser absorption spectroscopy. The molecule was formed in a flow system by reacting white phosphorus vapour and the products of a microwave discharge through a mixture of hydrogen and oxygen. Over 300 lines have been assigned between 1242cm^{-1} and 1267cm^{-1}. The band has the structure of an a-type transition of an asymmetric rotor. Most of the assigned lines were included in a least squares fit using Watson's *A*-reduced Hamiltonian. The band origin is 1258.540021(12)cm^{-1}. The rotational constants are in satisfactory agreement with those from Density Functional Theory and with those predicted from a comparison with the nitrogen analogue, *cis*-HONO:

$A_0 = 1.255036(55)$,$B_0 = 0.3188211(99)$,$C_0 = 0.2533085(91)$
$A_1 = 1.250424(55)$,$B_1 = 0.3181419(96)$,$C_1 = 0.2526089(96)$

Many of the remaining, unfitted lines are perturbed, particularly around K_a=7. The source of the perturbation will be considered.