

TEMPERATURE DEPENDENCE OF SELF- and NITROGEN-GAS LINE SHAPE PERTURBATIONS IN THE $\nu_1 + \nu_3$ BAND OF ACETYLENE

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The calibration of remote sensing measurements of the atmosphere of our own and other planetary bodies requires a knowledge of the temperature dependence of spectral line broadening caused by pressure dependent effects. We have extended the frequency comb-referenced measurements of line broadening in the $\nu_1 + \nu_3$ band of acetylene at 296 K, reported elsewhere at this symposium, to include low temperature pressure measurements at 175K, 200K and 240K. Additional data at still lower temperatures is currently being obtained. Line shape parameters for self- and nitrogen- broadening, narrowing and shifts have been determined at these temperatures on the assumption of the hard-collision model. This model was found to be the most appropriate in our earlier 296K data fitting. In addition to its intrinsic value, the temperature dependence of the derived parameters can give insight into the reliability of the physical assumptions of the model, and results of our analysis will be presented at the meeting.

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