

Line intensity measurements of methane's ν_3 -band using a cw-OPO

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Abstract

We report on absolute line strength measurements of P(1), R(0) and R(1) singlet lines in the $3.3\ \mu\text{m}$ ν_3 (C–H stretching) band of methane $^{12}\text{CH}_4$ at referencetemperature $T = 296\ \text{K}$. Line strength measurements are performed at low pressure ($P < 1\ \text{Torr}$) using direct absorption spectroscopy technique based on a widely tunable continuous-wave singly resonant optical parametric oscillator. The 1σ overall accuracy in line strength determinations ranges between 7 and 8 % mostly limited by pressure and frequency measurements. A comparison with previous reported values is made. Our results show good agreement with the HITRAN 2012 database.

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