

Evaluation of the greenhouse gases fundamental bands intensities via the analysis of low temperature liquids absorption profiles in the overtone region.

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Precise data on the intensities of strong fundamental absorption bands of greenhouse gases are important for reliable remote sensing of the atmosphere. It's not easy to obtain accurate values in the gas phase due to very low concentrations needed, as a rule, for such measurements. A new approach was developed being based on the analysis of the overtone absorption profiles in the spectra of these substances in the liquid phase, close to melting point. It was shown earlier that the profiles might be well described when the interaction of the transition dipole moments is taken into account. Now the experiments were carried out with molecular liquids SF₆, CF₄, SiF₄, NF₃, CHF₃, CClF₃, CBrF₃, OCS, N₂O and CO₂ with the use of IR spectrophotometer Brucker IFS-28 at 1 cm⁻¹ resolution. The condensation of the gases was performed in low temperature optical cells with path length 93 μm and 2.02 cm respectively. The evaluated from the analysis of these spectral data fundamental absorption bands intensities are coincide within 10% with the most reliable literature ones.