

SENSITIVITY OF TEMPERATURE AND CONCENTRATION MEASUREMENTS IN HOT GASES FROM FTIR EMISSION SPECTROSCOPY

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ABSTRACT. The IR emission spectra of combustion gases in a quasi two-dimensional burner have been measured and processed for temperature and concentration determinations. A Fourier transform spectrometer with a spectral resolution up to 0.02 cm^{-1} has been used in the spectral range $1700\text{--}4300\text{ cm}^{-1}$. An original data reduction procedure based on the adjustment of the measured spectra and calculated ones at low spectral resolution has been developed and is shown to be efficient for temperature, CO_2 and H_2O measurements. The temperature was also deduced from the ratio of the intensities of a suitable pair of CO lines and CO concentration was determined from individual CO line intensities. The sensitivity of the different data reduction procedures is discussed and FTIR results are also compared to probe measurements.