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Diagnostic of N2(A) concentration in high velocity nitrogen afterglow at atmospheric pressure ANNE-MARIE POINTU, EVGENY MINTUSOV, Paris-South University-CNRS — An optical emission diagnostic was used to measure N2(A) concentration in a high velocity (1000 cm/s) N2 flowing afterglow of corona discharge at atmospheric pressure, used for biological decontamination. Introducing impurities of NO (<1e-5) we used two well separated and relatively intense lines of NO gamma and beta bands (248nm and 321 nm), easily studied with a low resolution spectrometer. Based on a simplified transport kinetics, the technique is validated using a variation of lines intensity ratios used as coordinates, for numerous experimental points, measured at different axial distances and for different values of NO injected flow. Moreover, it has been demonstrated that N2(A) creation comes from N+N+N2 atom recombination with a global rate around 2e-33 cm^6/s, a result which agrees with literature, as well as N2(A) loss mechanisms were confirmed to go via quenching with O and N atoms. The order of magnitude of obtained N2(A) concentration, about 1e11 cm^{-3}, coincides with the results of direct measurement (by Vegard-Kaplan band), using a spectrometer of better resolution.

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