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Rate coefficients for the reaction of the hydroxyl radical with pyrrole

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The pulsed laser photolysis technique of radical generation, coupled to pulsed laser induced fluorescence detection of OH was used to measure absolute rate coefficients $k_1(P,T)$ for the title reaction, OH + C_4H_5N → products (R1). Experiments were conducted in conditions of temperature and pressure representative of the Earth's atmosphere, including for the first time at $T < 298$ K. Such conditions are frequently encountered in the field where (R1) is used to calibrate an instrument measuring OH reactivity. The accuracy of the data obtained was enhanced by on-line optical absorption measurements of [C_4H_5N] using a value of $\sigma_{184.9nm}$ = (1.26 ± 0.02)×10^{-17} cm^2 $molecule^{-1}$, which was determined in this work. Non-Arrhenius behaviour of $k_1(T)$ was observed, in line with results from the literature that were obtained at higher temperatures. Investigations of a possible pressure dependence in k_1 are ongoing.