

INFLUENCE OF CHEMICALLY ACTIVE ADDITIVES ON EMISSION SPECTRA OF THE FLAMES OF HYDROGEN AND DEUTERIUM OXIDATION IN NEAR IR REGION

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Band system in the region 852 – 880 nm and bands 670 and 846 nm over pressures 0.1 – 1 atm in the flames of mixtures of hydrogen with oxygen and air has been detected. The system is assigned to overtone transitions of H_2O_2 ($3\nu_1 + \sigma$) correspondingly arising from the reaction of $\text{HO}_2 + \text{HO}_2 \rightarrow \text{H}_2\text{O}_2 + \text{O}_2 + 33.5$ kcal/mole. The bands 670 and 846 nm are assigned to overtone transitions of HO_2 radical ($4\nu_1 + \sigma$) and ($3\nu_1 + \sigma$) correspondingly arising from the reaction of $\text{H} + \text{O}_2(+\text{M}) \rightarrow \text{HO}_2(+\text{M}) + 44$ kcal/mole. By this means the extent of energy of these elementary processes is located in vibrational degrees of freedom of products. It has been detected that HO_2 radicals occur originally in overtone-excited states in combustion both of hydrogen and deuterium in the presence of small additives of propylene as an inhibitor.