

# Hot-atom Chemiluminescence: A Beam Study of the $\text{O}(^3\text{P}) + \text{H}_2, \text{CH}_4$ Systems

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A beam of fast oxygen atoms in the  $\text{O}(^3\text{P})$  state was collided with  $\text{H}_2$  and  $\text{CH}_4$  at 10 – 300 eV<sub>lab</sub>. Chemiluminescence spectra for the  $\text{H}_2$  target show OH(A-X) emission, while for the  $\text{CH}_4$  target OH(A-X) as well as CH(A,B-X) emissions are observed. Excitation functions were obtained. For the  $\text{H}_2$  target they resemble those of  $\text{N}(^4\text{S}) + \text{H}_2$  collisions, while for the methane target the OH(A) yield increases with collision energy up to 50 eV<sub>CM</sub> and later decreases slowly, according to the “billiard ball” model.

*Key words:* Chemiluminescence; Energy Transfer; Chemical Reactions; Hot Atoms; Oxygen.