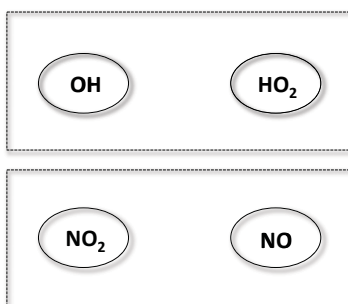


Atmos. Chem. Lecture 11, 10/16/13: Tropospheric Chemistry 2

Review: $\text{HO}_x + \text{NO}_x + \text{CO} \rightarrow \text{O}_3$
CH₄ oxidation
Expanded HO_x cycle
Oxidation of other organics

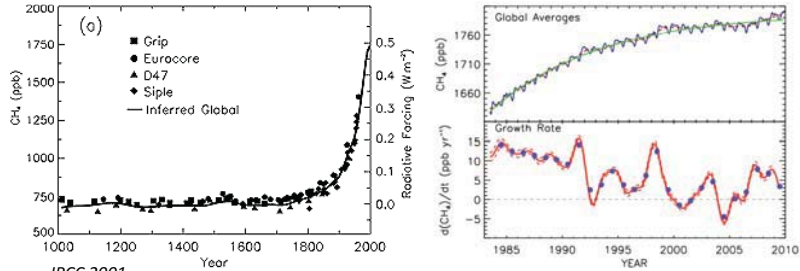
PSet 3 due Wednesday 10/23
Midterm on Wednesday 10/30

HO_x + NO_x families



[Note: Additional material is discussed here during lecture.]

Methane (CH₄)



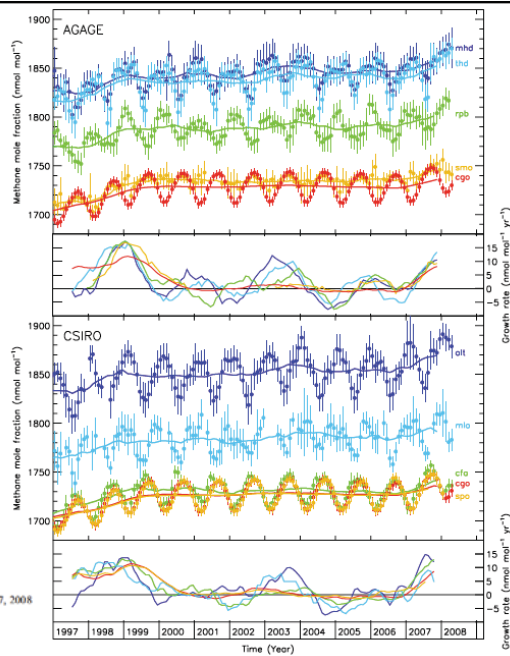
IPCC 2001
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NOAA ESRL
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Sources (Tg/yr) [IPCC 2007]

- | | |
|-------------------|-------------------------|
| Wetlands: 100-230 | Coal mining: 30-50 |
| Termites: 20-30 | Gas/oil/industry: 40-70 |
| | Landfills: 40-70 |
| | Biomass burning: 10-90 |
| | Rice paddies: 30-110 |
| | Animals: 80-90 |

Methane (CH₄)



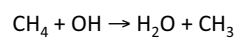
GEOPHYSICAL RESEARCH LETTERS, VOL. 35, L22805, doi:10.1029/2008GL036037, 2008

Renewed growth of atmospheric methane

M. Rigby,¹ R. G. Prinn,¹ P. J. Fraser,² P. G. Simmonds,² R. L. Langenfeldt,² J. Huang,¹
 D. M. Cunniff,² L. P. Steele,² P. B. Krummel,² R. F. Weiss,² S. O'Doherty,²
 P. K. Salameh,² H. J. Wang,² C. M. Harth,² J. Mühle,² and L. W. Porter^{2,3}

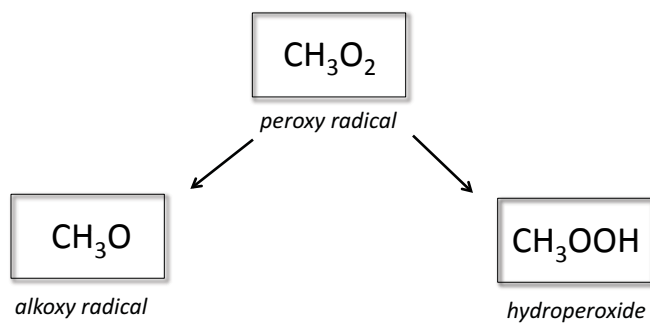
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[Note: Additional material is discussed here during lecture.]

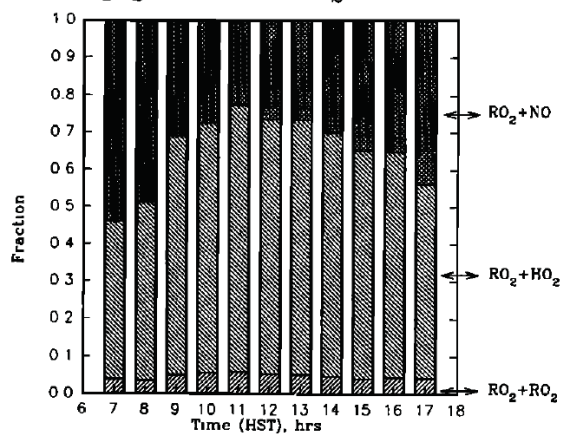
Organic peroxy radicals: Branching



[Note: Additional material is discussed here during lecture.]

Fate of CH_3O_2 : Remote, free troposphere

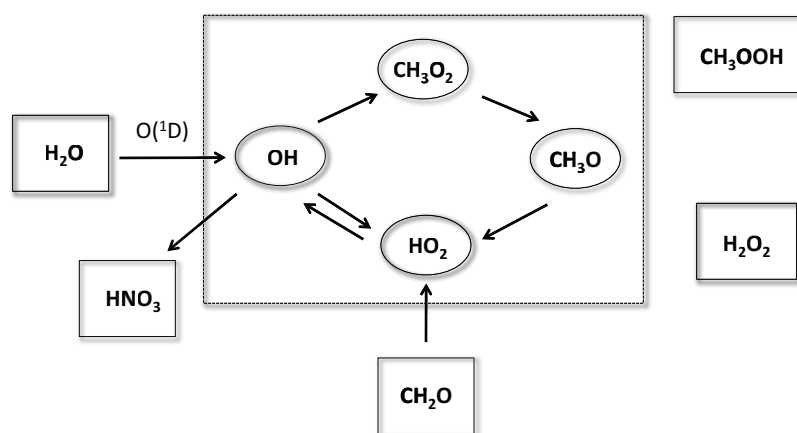
f) CH_3O_2 -Radical (RO_2) Loss



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Cantrell et al., *JGR*, 101:14653 (1996)

HO_x chemistry revisited



[Note: Additional material is discussed here during lecture.]

Main oxidants

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1.84J / 10.817J / 12.807J Atmospheric Chemistry
Fall 2013

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