

**Table 4. Calculated Lower Tropospheric Lifetimes (at 298 K) for Selected VOCs<sup>a</sup>**

VOC	OH	NO <sub>3</sub>	O <sub>3</sub>
propane	11 d	> 1.8 yr	> 4500 yr
2,2,4-trimethylpentane	3.5 d	1.4 yr	> 4500 yr
<i>n</i> -octane	1.4 d	240 d	> 4500 yr
ethene	1.4 d	225 d	10 d
propene	5.3 h	4.9 d	1.6 d
isoprene	1.4 h	48 min	1.3 d
α-pinene	2.7 h	5.4 min	4.7 hr
benzene	9.5 d	> 4 yr	> 4.5 yr
toluene	2.1 d	1.8 yr	> 4.5 yr
1,2,4-trimethylbenzene	4.3 h	26 d	> 4.5 yr
<i>o</i> -cresol	3.4 h	2.4 min	55 d
formaldehyde <sup>b</sup>	1.2 d	83 d	> 4.5 yr
acetone <sup>b</sup>	68 d	> 4 yr	
ethanol	3.6 d	> 23 d	
methyl <i>tert</i> -butyl ether	3.9 d	64 d	

<sup>a</sup> The 298 K rate constants are taken from Tables 1–3, except for those for *o*-cresol which are from Calvert et al.<sup>8</sup> and that for reaction of NO<sub>3</sub> radicals with methyl *tert*-butyl ether which is from Langer and Ljungström.<sup>59</sup> Lifetime calculated using the following: for OH radical reactions, a 12-h daytime average of  $2.0 \times 10^6$  molecule cm<sup>-3</sup>; for NO<sub>3</sub> radical reactions, a 12-h nighttime average of  $5 \times 10^8$  molecule cm<sup>-3</sup>; and for O<sub>3</sub>, a 24-h average of  $7 \times 10^{11}$  molecule cm<sup>-3</sup>. <sup>b</sup> Also undergo photolysis, with estimated lifetimes due to photolysis of ~4 h for formaldehyde with overhead sun, and ~60 d for acetone.<sup>9</sup>