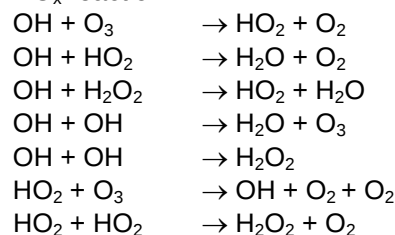
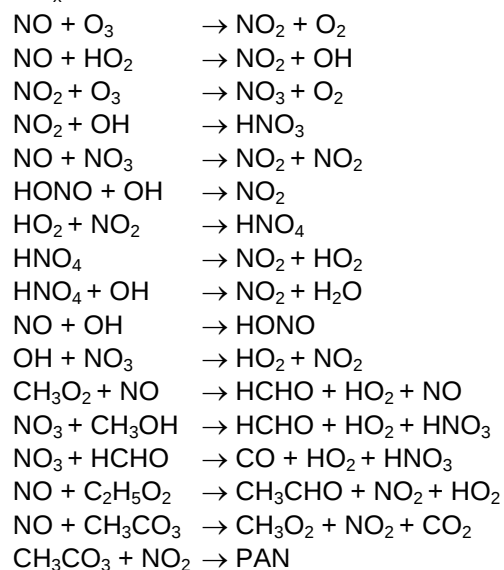


List of gas phase chemical reactions included in the model, rate constants are taken from Atkinson et al. 1997 unless otherwise noted in Table 5:

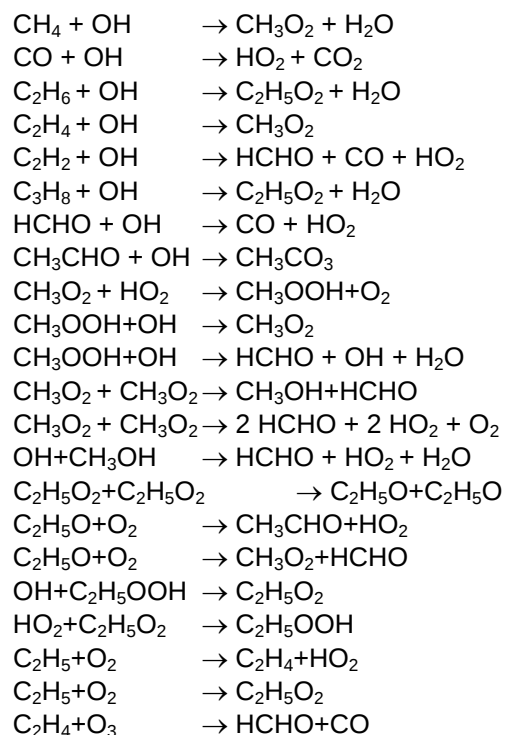
HO_x reaction



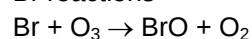
NO_x reactions

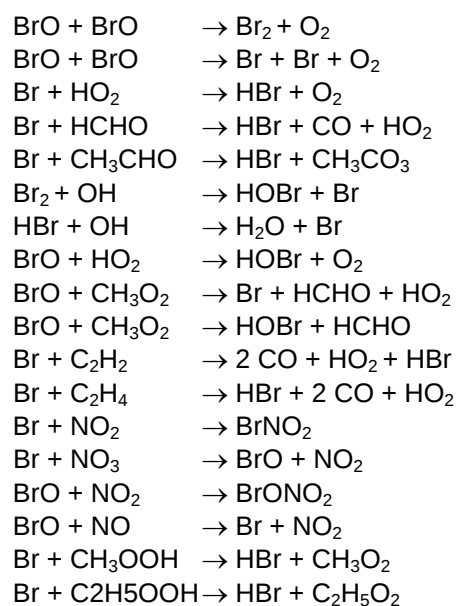


VOC reactions

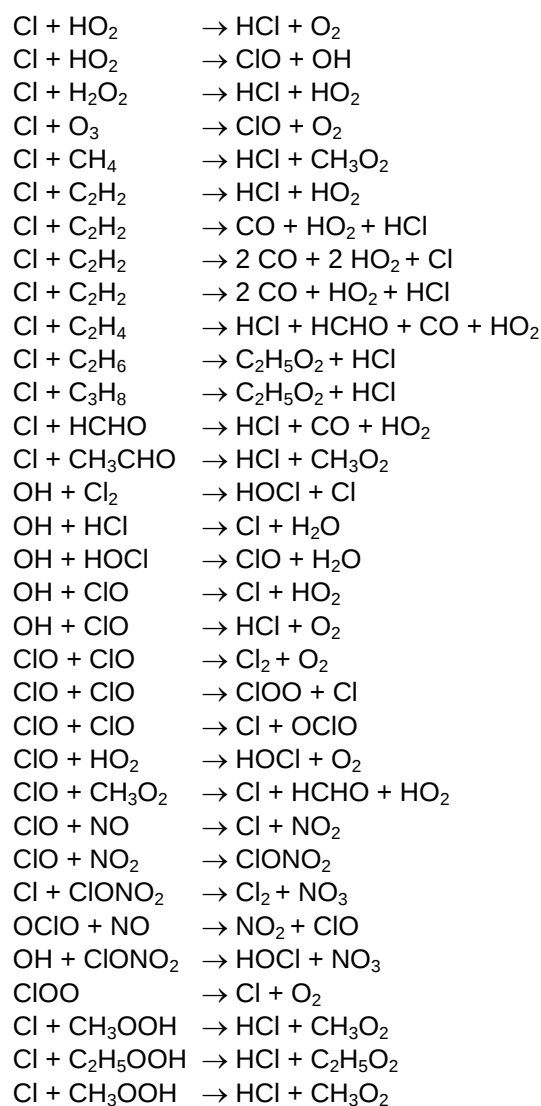


Br reactions

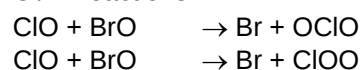




Cl reactions



Cl/Br reactions



$\text{ClO} + \text{BrO}$	$\rightarrow \text{BrCl} + \text{O}_2$
$\text{Br} + \text{OCIO}$	$\rightarrow \text{BrO} + \text{ClO}$
$\text{Br}_2 + \text{Cl}$	$\rightarrow \text{BrCl} + \text{Br}$
$\text{BrCl} + \text{Br}$	$\rightarrow \text{Br}_2 + \text{Cl}$
$\text{Br} + \text{Cl}_2$	$\rightarrow \text{BrCl} + \text{Cl}$
$\text{BrCl} + \text{Cl}$	$\rightarrow \text{Br} + \text{Cl}_2$