Table 4. List of homogeneous bromine reactions used in this study.

No.	Reaction	Reaction rate	Reference
R1	$BrO \xrightarrow{h\nu} Br + O^3P$	#1.0/ <BrO>	1
R2	$HOBr \xrightarrow{h\nu} Br + OH$	#1.0/ <HOBr>	1
R3	$BrNO_3 \xrightarrow{h\nu} Br + NO_3$	#1.0/ <BrNO3_1>	1
R4	$BrNO_3 \xrightarrow{h\nu} BrO + NO_2$	#1.0/ <BrNO3_2>	1
R5	$BrNO_2 \xrightarrow{h\nu} Br + NO_2$	#1.0/ <BrNO2>	1
R6	$Br_2 \xrightarrow{h\nu} 2Br$	#1.0/ <Br2>	1
R7	$Br + O_3 = BrO$	$1.6 \times 10^{-11} e^{-780/T}$	1
R8	$BrO + HO_2 = HOBr$	$4.5 \times 10^{-12} e^{460/T}$	1
R9	$Br + HO_2 = HBr$	$4.8 \times 10^{-12} e^{-310/T}$	1
R10	$HBr + OH = Br$	$6.7 \times 10^{-12} e^{155/T}$	1
R11	$BrO + BrO = 2Br$	$1.4 \times 10^{-12} e^{210/T}$	1
R12	$BrO + BrO = Br_2$	$2.9 \times 10^{-14} e^{840/T}$	1
R13	$BrO + NO = Br + NO_2$	$8.8 \times 10^{-12} e^{260/T}$	1
R14	$Br + BrNO_3 = Br_2 + NO_3$	4.9×10^{-11}	1
R15	$Br_2 + OH = HOBr + Br$	$2.1 \times 10^{-11} e^{240/T}$	1
R16	$BrO + OH = Br + HO_2$	$1.7 \times 10^{-11} e^{250/T}$	1
R17	$Br + NO_3 = BrO + NO_2$	1.6×10^{-11}	1
R18	$BrO + ClO = Br + Cl$	$4.7 \times 10^{-12} e^{320/T}$	1
R19	$BrO + MEO2 = 0.8HOBR + 0.2BR + 0.3HCOOH + 0.2HCHO + 0.13OH + 0.13HO_2$	$2.65 \times 10^{-14} e^{1600/T}$	1
R20	$CH_3Br + OH = Br$	$1.42 \times 10^{-12} e^{-1150/T}$	1
R21	$MB3^a + OH = 3Br$	$9.0 \times 10^{-13} e^{-360/T}$	1
R22	$MB2^b + OH = 2Br + HO_2$	$2.0 \times 10^{-12} e^{-840/T}$	1
R23	$MB2C^c + OH = 2Br + Cl$	$9.0 \times 10^{-13} e^{-420/T}$	1
R24	$MBC2^d + OH = Br + 2Cl$	$9.4 \times 10^{-13} e^{-510/T}$	1
R25	$MBC2^e + OH = Br + Cl + HO_2$	$2.1 \times 10^{-12} e^{-880/T}$	1
R26	$DMS + BrO = 0.75SO_2 + 0.25MSA + MEO2 + Br$	$1.5 \times 10^{-14} e^{1000/T}$	1
R27	$BrO + NO_2 = BrNO_3$	$k_0 = 5.2 \times 10^{-31(T/300)^{-3.2}}$, $k_\infty = 6.9 \times 10^{-12(T/300)^{-2.9}}$, $F = 0.6$ and $N = 1.0$	1
R28	$Br + NO_2 = BrNO_2$	$k_0 = 4.2 \times 10^{-31(T/300)^{-2.4}}$, $k_\infty = 2.7 \times 10^{-11(T/300)^{0.0}}$, $F = 0.6$ and $N = 1.0$	1
R29	$BrCl \xrightarrow{h\nu} Br + Cl$	#1.0/ <BrCl>	2
R30	$FMBR^f \xrightarrow{h\nu} Br + CO + HO_2$	# 1.0/ <FMBR>	2
R31	$MB3^a \xrightarrow{h\nu} 3.0Br + HO_2$	#1.0/ <MB3>	2
R32	$MB2C^c \xrightarrow{h\nu} 2.0Br + Cl + HO_2$	#1.0/ <MB2C>	2
R33	$MBC2^d \xrightarrow{h\nu} Br + 2.0Cl + HO_2$	#1.0/ <MBC2>	2
R34	$HCHO + Br = HBr + HO_2$	$7.7 \times 10^{-12} e^{-580/T}$	2
R35	$CCHO + Br = HBr + MECO_3$	$1.8 \times 10^{-11} e^{-460/T}$	2
R36	$ETHE + Br = FMBR^f + HCHO + HO2 + RO2C$	1.3×10^{-13}	2
R37	$OLE1 + Br = FMBR^f + CCHO + HO2 + RO2C$	3.6×10^{-12}	2
R38	$OLE2 + Br = FMBR^f + 0.75RCHO + 0.15ACET + 0.1MEK + HO2 + RO2C$	1.0×10^{-11}	2
R39	$ISOPRENE + Br = FMBR^f + PRD2 + HO2 + RO2C$	7.5×10^{-11}	2
R40	$FMBR^f + OH = Br + CO$	5.0×10^{-12}	2