Kinetics: Differential Rate Law Practice

For each data set below determine the:

a) order of each reactant
b) rate law expression
c) overall order of the reaction
d) value of the rate constant with proper units

1981

Experiment	Initial Conc. of Reactants (mole·liter^{-1})		Initial Rate of Reaction (mole·liter^{-1}·hr^{-1})
	A_o	B_o	
1	0.240	0.480	8.00
2	0.240	0.120	2.00
3	0.360	0.240	9.00
4	0.120	0.120	0.500
5	0.240	0.0600	1.00
6	0.0140	1.35	?

1984

Initial Rate of Formation of Z, (mol.L^{-1}.sec^{-1})	Initial $[X]_o$, (mol.L^{-1})	Initial $[Y]_o$, (mol.L^{-1})
7.0×10^{-4}	0.20	0.10
1.4×10^{-3}	0.40	0.20
2.8×10^{-3}	0.40	0.40
4.2×10^{-3}	0.60	0.60

1987

Experiment	Initial $[HgCl_2]$	Initial $[C_2O_4^{2-}]$	Initial Rate of Formation of Cl^- $(mol.L^{-1}.min^{-1})$
1	0.0836	0.202	0.52×10^{-4}
2	0.0836	0.404	2.08×10^{-4}
3	0.0418	0.404	1.06×10^{-4}
4	0.0316	?	1.27×10^{-4}

1991

Experiment	Initial $[ClO_2]$, $(mol.L^{-1})$	Initial $[F_2]$, $(mol.L^{-1})$	Initial Rate of Increase of $[ClO_2F]$, $(mol.L^{-1}.sec^{-1})$
1	0.010	0.10	2.4×10^{-3}
2	0.010	0.40	9.6×10^{-3}
3	0.020	0.20	9.6×10^{-3}

Experiment	Initial $[Br^-]$ (mol L^{-1})	Initial $[BrO_3^-]$ (mol L^{-1})	Initial $[H^+]$ (mol L^{-1})	Rate of Disappearance of BrO_3^- (mol L^{-1} s^{-1})
1	0.00100	0.00500	0.100	2.50×10^{-4}
2	0.00200	0.00500	0.100	5.00×10^{-4}
3	0.00100	0.00750	0.100	3.75×10^{-4}
4	0.00100	0.01500	0.200	3.00×10^{-3}