

4(a)(i)	the order of reaction with respect to $[H_2]$	1
	the order of reaction with respect to $[NO]$	2
	overall order of the reaction	3
4(a)(ii)	$\text{rate} \times \frac{1}{4}$	
4(a)(iii)	$\text{rate} \times 27$	
4(a)(iv)	a four-particle collision is unlikely	
4(a)(v)	step 1 $2NO \rightarrow N_2O_2$	
	step 2 $N_2O_2 + H_2 \rightarrow N_2O + H_2O$	
	step 3 $N_2O + H_2 \rightarrow N_2 + H_2O$	
4(a)(vi)	intermediate formed (step 2) then used up later (step 3)	
4(b)	$k = 0.693 / 720 = 9.625 \times 10^{-4} \text{ min}^{-1}$ AND units: s^{-1}	
4(c)(i)	homogeneous AND Co^{3+} / catalyst / it is in the same phase / same state as the reactants	
4(c)(ii)	M1: (equation 1) $2Co^{3+} + 2I^- \rightarrow 2Co^{2+} + I_2$	
	M2: (equation 2) $2Co^{2+} + S_2O_8^{2-} \rightarrow 2Co^{3+} + 2SO_4^{2-}$	
4(c)(iii)	repulsion of two negative / same charge ions slows the reaction / raises E_A	