Chemy 102_ Second Semester 2012-2013_Quiz 3 /10

Name ..... Key ..... ID .....Sec ....

order	Concentration–Time Relation
0	$[A]_t = [A]_o - kt$
1	$\ln \frac{[A]_o}{[A]_t} = kt$

order	
2	$\frac{1}{[A]_t} = \frac{1}{[A]_o} + kt$

R= 8.31 J/mol.K

Q1. Consider the reaction $2SO_2\,(g) + O_2\,(g) \rightarrow 2\,SO_3\,(g)$
If O_2 is being reacted at a rate of 3.56×10^{-3} *M*/s, what is the rate of formation of SO_3? **(2 marks)**

(a) -3.56×10^{-3} M/s (b) 3.56×10^{-3} M/s (c) -7.12×10^{-3} M/s
(d) 7.12×10^{-3} M/s (e) 1.78×10^{-3} M/s

Q2. The following data are obtained at a given temperature for the reaction
$2\,X + Y_2 \rightarrow 2Z$ **(2 marks)**

[X] (*M*)	[Y_2] (*M*)	Rate (/*M*s)
0.030	0.0055	8.55×10^{-3}
0.030	0.0110	1.71×10^{-2}
0.060	0.0055	3.42×10^{-2}

Determine the order of reaction with respect to [X].

(a) Zero-order (b) first-order (c) second-order
(d) can not be determined.

Q3. The reaction $A \rightarrow B$ has a rate constant of 0.025 s^{-1} at a certain temperature. How long (in seconds) will it take to react 85% of A? **(2 marks)**

(a) 75.9 s (b) 6.5 s (c) 759 s (d) 65 s (e) 650 s

Q4. A reaction is found to have an activation energy of 108 kJ/mol. If the rate constant for this reaction is $4.60\times10^{-6}s^{-1}$ at 275 K, what is the rate constant at 366 K? **(2 marks)**

(a) 5.81 s^{-1} (b) 11.7 s^{-1} (c) 1.72 s^{-1} (d) 3.63 s^{-1} (e) 0.581 s^{-1}

Q5. How many half-lives are required for the concentration of reactant to decrease to 12.5% of its original value? **(2 mark)**

A) 1 B) 3 C) 1.5 D) 2.5 E) 2