

## Quiz 14.2 – Integrated Rate Laws

Name: \_\_\_\_\_

**Question 1**

Radioactive decay follows 1st-order kinetics

Give the rate constant or half-life of the following radioactive elements

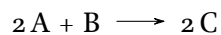
Element	Half-life	Rate Constant $\left(\frac{M}{s}\right)$
$^{14}\text{C}$	5730 <i>y</i>	
$^{57}\text{Co}$		$2.95 \times 10^{-8}$
$^{99}\text{Tc}$	6.0 <i>h</i>	
$^{218}\text{Po}$		0.00373
$^3\text{H}$	12.3 <i>y</i>	

**Question 2**

For each order of reaction, will the half-life increase, decrease, or stay constant over the course of a reaction?

**Question 3**

Use the data provided by email to determine the rate constant, overall reaction rate, and reaction rate with respect to each reactant in the reaction:



*If—*

By Rudyard Kipling

If you can keep your head when all about you  
Are losing theirs and blaming it on you,  
If you can trust yourself when all men doubt you,  
But make allowance for their doubting too;  
If you can wait and not be tired by waiting,  
Or being lied about, don't deal in lies,  
Or being hated, don't give way to hating,  
And yet don't look too good, nor talk too wise:

If you can dream—and not make dreams your master;  
If you can think—and not make thoughts your aim;  
If you can meet with Triumph and Disaster  
And treat those two impostors just the same;  
If you can bear to hear the truth you've spoken  
Twisted by knaves to make a trap for fools,  
Or watch the things you gave your life to, broken,  
And stoop and build 'em up with worn-out tools:

If you can make one heap of all your winnings  
And risk it on one turn of pitch-and-toss,  
And lose, and start again at your beginnings  
And never breathe a word about your loss;  
If you can force your heart and nerve and sinew  
To serve your turn long after they are gone,  
And so hold on when there is nothing in you  
Except the Will which says to them: 'Hold on!'

If you can talk with crowds and keep your virtue,  
Or walk with Kings—nor lose the common touch,  
If neither foes nor loving friends can hurt you,  
If all men count with you, but none too much;  
If you can fill the unforgiving minute  
With sixty seconds' worth of distance run,  
Yours is the Earth and everything that's in it,  
And—which is more—you'll be a Man, my son!