Chem 2/5 Nuclear Decay Lab Report

(Typed Report—Lab partners are to submit independent reports using shared data)

Your Name__________ Section__________ Date _________ TA Name _________

Purpose:

• Concise description of what is to be done (details of sample, sample size, irradiation, counting, etc.)

Procedure:

• Brief description of procedure used

Data and Calculations:

• Tables of collected data: (Your group’s data and 1 other group’s data)

• Plots: Four plots total, properly titled and labeled.

Your Group’s Data (Computer) Other Group’s (Computer)

1. Counts/minute vs. time 3. Counts/minute vs. time
2. ln(counts/minute) vs. time 4. ln(counts/minute) vs. time

• Calculations: (Make sure to show work on ALL calculations, may be handwritten)

  o $k =$ Rate constant calculated 2 ways for each data set.
    (Recall $k = -m$, the negative of the slope.)
    ▪ Calculate the slope of the ln(counts/minute) vs. time graph from $m = (y_2 - y_1)/(x_2 - x_1)$ by hand.
    ▪ Get slope from the computer-generated linear regression equation of the ln(counts/minute) vs. time graph ($y = mx + b$).

  o $t_{1/2} =$ Half-life (minutes) calculated 2 ways for each data set
    ▪ Estimate half-life from the counts/minute vs. time plot by hand.
    ▪ Calculate from the computer-generated linear regression equation of the ln(counts/minute) vs. time graph and the fact that $t_{1/2} = 0.693/k$. 


- $A_0 =$ Initial activity for both data sets calculated just one way.
  - From the slope from the computer-generated linear regression equation of the ln(counts/minute) vs. time graph ($y = mx + b$) where $A_0 = e^{\ln(\text{counts/minute})_0}$, and ln(counts/minute)$_0$ is the y-intercept, b).

- **Discussion**
  - Restate results and compare the results of each set of data.
  - Compare the values calculated between each calculated method.
  - Support the results and explain any inconsistencies.

- **Conclusion**
  - Give a brief summary of the experiment and findings along with what can be concluded from this experiment.

*Note, a laboratory report is not an editorial, it is a scientific presentation and explanation of the facts found through experimentation.*