

Rate Models, Half-Life, and Data Linearization

g11_u03_w10

All values are original fictional paper data. No chemical activity is requested. Use algebra/graphs only; a fitted model does not prove a mechanism.

1. Define average rate.

2. Calculate $(0.80 - 0.50)/(6.0 - 0.0)$.

3. State its units if quantity is mol/L.

4. Define half-life.

5. Starting at 16.0 units, give amount after one half-life.

6. After two half-lives.

7. After three half-lives.

8. Explain why equal half-lives are a model pattern.

9. Compare linear and curved concentration-time plots.

10. State what a straight transformed plot can support.

11. State what it cannot prove.

12. A line has slope -0.125 min^{-1} ; interpret sign.

13. Calculate $0.693/0.125$.

14. State units for item 13.

15. Why is this a supplied model relation, not calculus derivation?

16. A fit has one large residual. Name two checks.

17. Distinguish correlation and causation.

18. Explain why extrapolation needs a boundary.

19. State one uncertainty source in a data card.

20. Write a bounded rate-model conclusion.
