CHEM 1212K Reading Day Solutions

Ch. 14: Chemical Kinetics

Answers

1. True/False:

    a) FALSE

    b) FALSE - by lowering activation energy, they increase the proportion of collisions with sufficient energy, not the same as increasing the number of collisions

    c) TRUE

    d) TRUE - it is a single step mechanism

    e) FALSE - appear as a reactant first (that's how you differentiate between intermediates and catalysts)

    f) FALSE - eliminate them by substitution

    g) TRUE - even though they aren't in the overall reaction, they will usually appear in the rate law. Intermediates are the ones that should be eliminated by substitution and should not appear in the rate law. They won't be expected to be zero order. Catalysts obviously impact reaction rate.

    h) FALSE - forward and reverse RATES are equal - not the constants

    i) FALSE - there is one K for a given temperature, but an infinite combination of concentrations to achieve that K value

    j) FALSE- the rate of reactions will be equal but they will continue to react

2. M/s; 1/s; 1/Ms

3. rate = $k[OH^-][CH_3Br]$

4. a) a = 1, b = 2, c = 0, overall = 3; b) rate = $[A][B]^2$; c) $k = 2 \times 10^{-5}\ L^2/(mmol)^2s$; d) 2.9×10^{-6} mmol/L*s

5. E--one half life gets rid of 50% of the original material; another gets rid of 25% of the original material. Total, it takes 2 half lives (12 hours) to get rid of 75% of the material.

6. D--halving the [A] leads to half the rate. Halving the [B] leads to half the rate. The reaction is first order in both reactants

7. D--these are points of collision theory. II is not true in reference to the question. The question is asking about the rate of the collisions that happen, so any that don't happen are irrelevant

8. rate = k[HgCl2][C2O4-2]^2
    1. Initial oxalate concentration: 0.514M

<u>Ch. 17 Aqueous Equilibrium (Titrations, buffers, Ksp)</u>

Answers:

1. A
2. E
3. D
4. A
5. E
6. D
7. a) 4.75 b) 6.3
8. a) 3.82 b) 234 g/mol
9. 1e(-12)