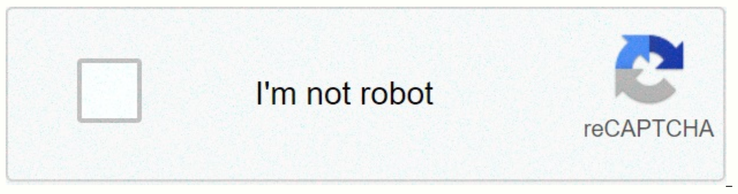

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Chapter 17 reaction rates answer key

1. Instantaneous speed is the reaction rate over any given period of time, which shall be so short that the concentration of reagents and products varies by insignificant quantities. The initial speed is the instantaneous reaction rate as it begins (as the product just starts to build up). Average speed is the average of the instantaneous rate over a period of time. Rate 3=+12Δ[ClF3]Δt=−Δ[Cl2]Δt=−13Δ[F2]Δtrate=+12Δ[ClF3]Δt=−Δ[Cl2]Δt=−13Δ[F2]Δt 5. (a) mean, 0 – 10 s = 0.0375 mol L−1 s−1; mean, 10 -20 s = 0.0265 mol L−1 s−1; (b) Instantaneous speed, 15 s = 0.023 mol L−1 s−1; (c) mean B-formation rate = 0.0188 mol L−1 s−1; the mean instantaneous rate in case of B formation = 0.012 mol L−1 s−17. Higher molarity increases the rate of reaction. Higher temperatures increase the reaction rate. Smaller pieces of magnesium metal will react faster than larger pieces because there are more reactive surfaces. 9. (a) Depending on the angle chosen, the atom may take a long time to collide with the molecule, and if a collision occurs, it must not cause the ligament to break and the formation of the other side. (b) Particles of reaction substances must come into contact with each other before they can react. 11. (a) very slowly; b) The reaction occurs faster when the temperature is increased. The amount of reagents is decreasing and the quantity of products increases. After some time there is approximately the same amount in BC, AB, and C mixture and slightly exceeds A. 15(a) The process reduces the speed by a factor of 4.b) Since CO does not appear in the rate legislation, the rate is not affected. 19. Rate 21 = k; k = 2.0 ×× 10-2 mol L−1 h−1 (approximately 0.9 g L−1 h−1 for the female male); The reaction is zero. Rate 23 = k[NOCl]2; k = 8,0 ×× 10-8 L/mol/h; in the second order25. rate = k[NO]2[Cl2]; k = 9,1 L2 mol−2 h−1; second order NO; the first order cl227. b) k = 7,88 ×× 10−3 L mol−1 s−129. a) 4,5 ×× 10-4 mol/l/min rate 31 = k[I-][OCl−]; k = 6.1 ×× 10−2 L mol −1 s−133. The sketching of the Ln[SO2Cl2] graph compared to t reveals a linear trend; therefore we know that this is the first order response: k = −2.20 ×× 105 s−134. The piece is well linear, so the reaction is the second sequence. k = 50,1 L mol−1 h-142. The reaction is the first order. k = 1,0 ×× 107 L mol−1 min–144.1.16 × 103 s; 20% is still 48. [A]0 (M) as ×× 103 (s−1) 4.88 2.45 3.52 2.51 2.29 2.53 1 81 2.58 5.33 2.36 4.05 2.47 2.95 2.48 1.72 2.43 50. Either reagents can move too slowly to have enough kinetic energy to exceed the reaction activation energy, or the orientation of molecules, if they collide, can prevent the reaction from occurring. 52. Activation energy is the minimum amount of energy activated complex during the reaction. It is usually expressed as the energy needed to form a single mole in the activated complex. 54. After finding k at several different temperatures, ln k to 1T,1T is a straight line with an inclination Of -EaR-EaR from which Ea.56 can be determined. (a) 4 times faster (b) 128 times faster 58.64. Ea = 108 kJ; A = 2,0 ×× 108 s−1; k = 3.2 ×× 10-10 s−1; (b) 1,81 ×× 108 h or 7,6 ×× at day 106; (c) Assuming that the reaction is irreversible, simple calculation, because we do not have to take into account any reactive that returns to its original state after conversion into a product.66. The atom has enough energy to react with BC; however, the different angles at which it bounces from BC without reaction indicate that the orientation of the molecule is an important part of the reaction kinetics and determines whether the reaction will occur. 68. In general, as regards the overall response, we cannot predict the impact of a change in concentration without knowing the rate law. Yes. If the reaction is an elementary reaction, double the rate of the concentration A. 70. Rate = k[A][B]2; Rate = k[A]3 72. (b) rate2 = k[O3][Cl]; (c) rate3 = k[ClO][O]; (d) rate2 = k[O3][NO]; (e) Rate3 = k[NO2][O] 74. [H2] must enter the rate rule to first power. Doubling [NO] increases speed by a factor of 4. [NO] must enter the bet laws of the second power. (b) rate = k [NO]2[H2]; c) k = 5,0 ×× 103 mol−2 L−2 min−1; (d) 0,0050 mol/l; (e) Stage II is the stage of determination of speed. If step I gives N2O2 sufficient, steps 1 and 2 shall be combined to give 2NO+H2⟶H2O+N2O.2NO+H2⟶H2O+N2O. This reaction is in line with the observed rate legislation. Combine steps 1 and 2 with step 3, which happens, assuming quickly to provide appropriate stoichiometry. 76. The overall mode of action of the catalyst is to provide a mechanism by which reagents can more easily merge using a path with less reaction energy. Both forward and reverse response rates have increased, leading to a faster equilibrium. 78a Chlorine atoms are a catalyst as they react in the second stage but are recovered in the third stage. Thus, they are not used, which is characteristic of catalysts. (b) NO is a catalyst for the same reason as in part a. 82. The lowering of the transitional state energy indicates the effect of the catalyst. (a) B; B; (b) point B84. The energy required to move from baseline to transition is (a) 10 kJ; (b) 10 kJ 86. Both diagrams describe two-step, exotermic reactions, but with different changes in enthalpy that suggest diagrams depict two different general reactions. Teacher Pages Adams, Randy Ali, Jamila Alvarez, Robert Andrzejewski, John Aranda, Vi Arteche, Zachary Baden, Joy Katie Barnes, Stephne Barnes-joshua, Ionne Beal, Alisa Benanti, James Berry, April Berry, Ted Biley, Greg Block, Heather Bruton, Mary Cabrera, Jorge Caperton, Stephen Casey, Denise Classen, Jennifer Cobb, Allison Colbert, Tim Comadena, Sean Craw, Sarah De La Cruz, Maggie De Voe, Paul del Rosario, Joan Delmonico, Troy DeVoe, Aaron Dewey, Diaz, Lisa, Jesse, Engel, Jennifer Farina, Kris Farmer, Mackyense Field , Corinne Ford, Brandon Freibott, Brittany Fry, Matt Glass, Coy Gonzales, Mike Haugh, Kevin Holcombe, Lauren Hunter, Daphne Jacobsen, Amber Jakstis, Matthew Johnston, Matthew Kettering, Pam Manning, Pat Marshall, Kristi Martinez, Fernando McFarland, Michael Mclean, Hilary Memory, Eric Mitchell (Eric Mitchell), Kent Melanie Molnar, Pat Murguia, Joshua Nelson, Laurel Norman, Matthew Ochoa, Jamie Olmedo, Miguel Peske, Wendy Wendytke, Wendy Wen Regalado, Brian Rice , Jason Sanders, Rose Sandoval, Julio Smith, Jeff Smith, Richard Soto Gonzales, Corrine St George, Donna Stangel, Bob Tilson, Benjamin Trueba, Matthew Turnpaugh, Stacey Valadez, Mike Valencia, Estevan Verhoeven, James Villagrana, Noemi Wagner, Todd Walker, Jason Webb Hillman, Jennifer White, Judy White, Tracey Wilder, Ashley Williamson, Valerie Wingo, Heather Boyer, Larry Cain, Peter Cockrell, Joanna Ams, Jeffrey Klham, Rebeccaing, Nataling, Kris Major , Brandy Murillo, Jennifer Padilla, Christa Smith, Nathan Tolbert, Martyne Teacher, RHS 1. 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