

Ch. 14: Reaction Rates and Equilibrium

Group	Problem No. p. 451	Solution
1	11 (a, b)	(a) R, (b) R
2	11 (c, d)	(c) L, (d) L
3	11 (e, f)	(e) R, (f) L
4	11 (g, h)	(g) L, (h) no effect

Group	Problem No. p. 452	Solution
1	16 (a)	$K_{eq} = \frac{[O_3]^2}{[O_2]^3}$
2	16 (b)	$K_{eq} = \frac{[NO_2]^2}{[N_2][O_2]^2}$
3	16 (c)	$K_{eq} = \frac{[C_2H_6]}{[C_2H_2][H_2]^2}$
4	16 (d)	$K_{eq} = \frac{[CH_4][H_2S]^2}{[H_2]^4[CS_2]}$

Group	Problem No.	Solution
1, 2	14-17	$K_{eq} = 1.0 \times 10^8 \Rightarrow$ Products are favored
3, 4	14-18	$K_{eq} = 5 \times 10^{-7} \Rightarrow$ Reactants are favored

Groups	Problem No.	Solution
1-4	14-20	$K_{eq} = \frac{[O_3]^2}{[O_2]^3} = \frac{(0.12)^2}{(0.35)^3} = 0.34$

Groups	Problem No.	Solution
1-4	14-22	$K_{eq} = \frac{[CS_2][O_2]^4}{[SO_3]^2[CO_2]} = \frac{(6.2 \times 10^{-4})(1.0 \times 10^{-4})^4}{(2.0 \times 10^{-2})^2(4.5 \times 10^{-3})} = \frac{6.2 \times 10^{-20}}{1.8 \times 10^{-6}} = 3.4 \times 10^{-14}$

Group	Problem No.	Solution
1	14-36 (a)	$K_b = \frac{[N_2H_5^+][OH^-]}{[N_2H_4]}$
2	14-36 (b)	$K_a = \frac{[H^+][CN^-]}{[HCN]}$
3	14-36 (c)	$K_a = \frac{[H^+][HC_2O_4^-]}{[H_2C_2O_4]}$
4	14-36 (d)	$K_a = \frac{[H^+][HPO_4^{2-}]}{[H_2PO_4^-]}$

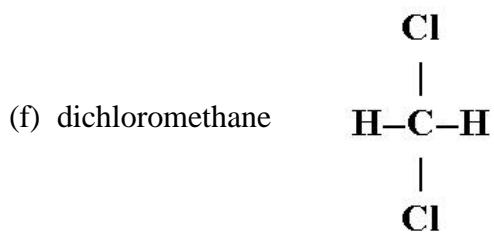
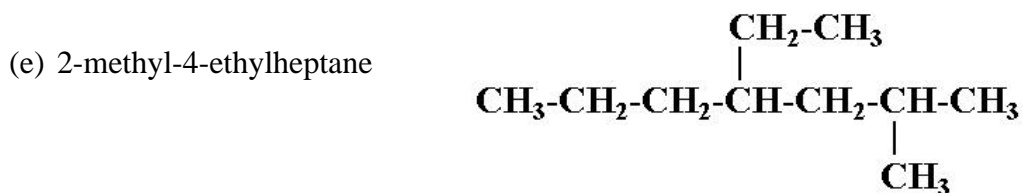
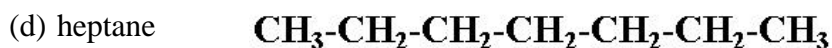
Groups	Problem No.	Solution
1-4	14-37	<p>0.10 M HX has pH = 5.0</p> <p>0.10 M HB has pH = 5.8</p> <p>HB is the weaker acid because it has a higher pH.</p> <p>K_a for HX is higher because it is more fully – dissociated.</p>

Group	Problem No.	Solution
1, 2	14-39	<p>$\text{HOCN} \rightleftharpoons \text{H}^+ + \text{OCN}^-$</p> <p>$[\text{HOCN}] = 0.20\text{M} - 6.2 \times 10^{-3}\text{M} = 0.19\text{M}$</p> <p>$K_a = \frac{[\text{H}^+][\text{OCN}^-]}{[\text{HOCN}]} = \frac{(6.2 \times 10^{-3})(6.2 \times 10^{-3})}{0.19} = 2.0 \times 10^{-4}$</p> <p>$\text{pH} = -\log(6.2 \times 10^{-3}) = 2.2$</p>
3, 4	14-40	<p>$\text{HX} \rightleftharpoons \text{H}^+ + \text{X}^-$</p> <p>Initially, $[\text{HX}] = 0.58\text{M}$</p> <p>At equilibrium, $[\text{H}^+] = [\text{X}^-] = 0.100 \times 0.58\text{M} = 0.058\text{M}$</p> <p>and $[\text{HX}] = 0.58\text{M} - 0.058\text{M} = 0.52\text{M}$</p> <p>$K_a = \frac{[\text{H}^+][\text{X}^-]}{[\text{HX}]} = \frac{(0.058)(0.058)}{0.52} = 6.5 \times 10^{-3}$</p> <p>$\text{pH} = -\log(0.058) = 1.2$</p>

Ch. 16: Organic Chemistry Nomenclature

Reference: Ch. 16 pages 484-491

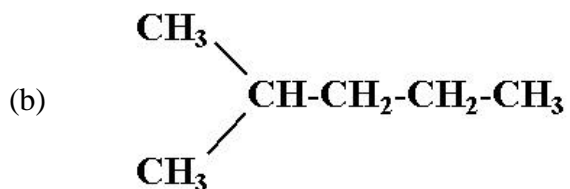
1. Draw a Lewis structure for each of the following molecules.



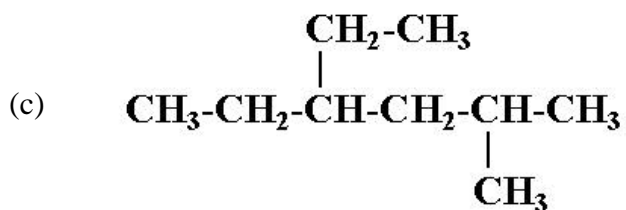
2. Give the IUPAC name of the following compounds.



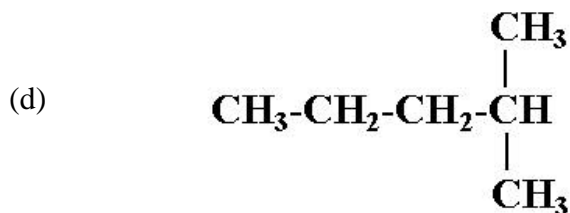
Butane



2-methylpentane



2-methyl-4-ethylhexane



2-methylpentane