

Answers:

Organic Chemistry

1a: $C_{24}H_{48}$ b: $C_{10}H_{18}$ c: $C_{45}H_{92}$ d: C_3H_4

2a: -ene b: -ane c: -yne d: -ane e: -yne

3 #61a: pentane b: 3-methylpentane c: 2, 5-dimethylhexane d: 2, 3-dimethylbutane

#67a: 4-ethyl, 3-methyl, 3-heptene

#68: any combination EXCEPT for b and d (b and d are the same)

#3: b

#5: d

#69a: alcohol, carboxylic acid, amine (you don't need to know amine)

#69b: ketone

#73: ester, alcohol

#1: a

Equilibrium Constant

#2: correction! Question should read "...if the equilibrium concentration..." NOT "...if the initial concentration..."

Answer: $[C_2H_4] = 0.335M$ $[H_2] = 0.526M$ $[C_2H_6] = 0.17M$

#3: 16 (don't worry about this one...it's extra hard)

#4: 0.0013 M

K_a & K_w & pH

1. 10.99; $9.7 \times 10^{-4}M$; $1.0 \times 10^{-11}M$

2. 5.44; $3.6 \times 10^{-6}M$; $2.8 \times 10^{-9}M$

3. 3.583; 10.417; $3.83 \times 10^{-11}M$

4. 8.654; 5.346; $2.22 \times 10^{-9}M$

5. 12.98; $1.0 \times 10^{-13}M$; $9.5 \times 10^{-2}M$

6. #20: 2.2×10^{-9}

#21: 1.4×10^{-5}

#24: 0.1845M

#25: 2.439M

Redox

#1: P is oxidized, Cl is reduced, P is the reducing agent, Cl_2 is the oxidizing agent

#2: C is oxidized, H is reduced, C is the reducing agent, H_2O is the oxidizing agent

#3a: Na: +1; Se: +4; O: -2 b: H: +1; Au: +3; Cl: -1 c: H: +1; B: +3; O: -2

#4a: P: +4; O: -2 b: Na: +1; O: -1 c: As: +5; O: -2

#5a: 3 e⁻ lost, oxidation; b: 2 e⁻ gained, reduction; c: 1 e⁻ lost, oxidation

#6: 2, 3, 2 $H^+ \rightarrow$ 2, 3, 4 H_2O

#8a: 1, 4, 6 $H^+ \rightarrow$ 1, 2, 3 H_2O

#8b: 2, 1, 3 $H_2O \rightarrow$ 2, 2, 2 H^+

9: 1, 2 \rightarrow 1, 1

10: 2, 5, 1 $H^+ \rightarrow$ 2, 5, 3 H_2O

12: 3, 1, 3 $H^+ \rightarrow$ 1, 3, 3 H_2O

Miscellaneous

1. property that changes depending on the amount of substance and not necessarily on the identity. Salt splits into two ions, sugar does not dissociate

2. crosslinking, trees, a hydrocarbon ring made up of 6 carbons with alternating single and double bonds