

Problem Set 12

1. Name the following organic compounds:

A	CH ₄	K	C ₂ H ₄	U	C ₂ H ₂
B	C ₂ H ₆	L	C ₃ H ₆	V	C ₃ H ₄
C	C ₃ H ₈	M	C ₄ H ₈	W	C ₄ H ₆
D	C ₄ H ₁₀	N	C ₅ H ₁₀	X	C ₅ H ₈
E	C ₅ H ₁₂	O	C ₆ H ₁₂	Y	C ₆ H ₁₀
F	C ₆ H ₁₄	P	C ₇ H ₁₄	Z	C ₇ H ₁₂
G	C ₇ H ₁₆	Q	C ₈ H ₁₆	AA	C ₈ H ₁₄
H	C ₈ H ₁₈	R	C ₉ H ₁₈	AB	C ₉ H ₁₆
I	C ₉ H ₂₀	S	C ₁₀ H ₂₀	AC	C ₁₀ H ₁₈
J	C ₁₀ H ₂₂	T	C ₁₁ H ₂₂	AD	C ₁₁ H ₂₀

2. Name the following radicals, including all the isomers of the radicals:

A	CH ₃ •
B	C ₂ H ₅ •
C	C ₃ H ₇ •
D	C ₄ H ₉ •
E	C ₅ H ₁₁ •
F	C ₆ H ₁₃ •

3. Draw the following compounds based on their IUPAC names:

A	2,3,5,7-tetramethylnonane	K	Cis-2-butene
B	2,3-dimethylbutane	L	1,3-butadiene
C	3,4-dimethylhexane	M	2-methyl-2-butene
D	5-ethyl-2,4,6-trimethylheptane	N	4-methyl-1,3,6-octatriene
E	4-isopropyl-2-methylhexane	O	1,3,5-hexatriene
F	2,2-dimethylpropane	P	3-isopropyl-2,4-dimethyl-1-pentene
G	7-ethyl-4-isobutyl-2-methylnonane	Q	1,2,4,5-hexatetraene
H	2,2,3,3-tetramethylbutane	R	2-butene
I	Ethane	S	1-trans-4-hexadiene
J	4-ethyl-3,7-dimethyldecane	T	3-ethyl-4-propyl-3-heptene

4. Write out and complete the following reactions:

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| A. ethane plus chlorine in light | B. propane plus chlorine in light |
| C. isobutane plus chlorine in light | D. butane plus bromine in light |
| E. 2,3-dimethylpropane plus bromine in light | |
| F. C ₆ H ₁₄ plus XS O ₂ | G. C ₅ H ₁₂ plus XS O ₂ |

H. C_2H_6 plus XS O_2

I. C_8H_{18} plus XS O_2

J. $C_{20}H_{42}$ plus XS O_2

K. CH_4 plus XS O_2

5. What kinds of bonds are between carbon atoms in alkanes? What is the hybridization of these carbon atoms?
6. What kinds of bonds are between carbon atoms double-bonded to each other? What is the hybridization of these carbon atoms?

Problem Set 13

1. Draw the structures for the following organic molecules:

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|--------------|--------------|--------------|-------------|
| A. Ethyne | B. Propyne | C. 1-Butyne | D. 2-Butyne |
| E. 1-Pentyne | F. 2-Pentyne | G. 1-Hexyne | H. 2-Hexyne |
| I. 3-Hexyne | J. 2-Heptyne | K. 3-Heptyne | L. 4-Octyne |

2. Write out and complete the following reactions:

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| A. 1-butene + HCl | B. 1-butene + HF |
| C. 1-butene + H ₂ O + H ⁺ | D. 2-butyne + H ₂ + Ni |
| E. 2-butyne + Na + NH ₃ (aq) | F. 3-hexyne + H ₂ + Ni |
| G. 3-hexyne + Na + NH ₃ (aq) | H. propyne + water + H ₂ SO ₄ + HgSO ₄ |
| I. 1-butyne + H ₂ O + H ₂ SO ₄ + HgSO ₄ | J. 2-butyne + H ₂ O + H ₂ SO ₄ + HgSO ₄ |
| K. isopropyl alcohol + H ₂ SO ₄ + heat | L. 1-propanol + KMnO ₄ |
| M. 2-butanol + CrO ₃ | N. formic acid + methanol + H ⁺ |
| O. toluene + Br ₂ | P. Benzoic acid + trimethylammonium ion |
| Q. glycerine + nitric acid | R. Make any acid chloride, then use your product to make any amide |

3. Draw the structures for the following organic molecules:

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|-------------------|------------------|------------------|-------------------|
| A. Hexanal | B. Propanal | C. Ethanal | D. Octanal |
| E. Butanal | F. Ethanoic acid | G. Nonanoic acid | H. Pentanoic acid |
| I. Heptanoic acid | J. Formamide | K. Decanamide | L. Propanamide |

4. Draw the following amino acids:

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|--------|------------|--------|--------|--------|--------|
| A. Ala | B. Gly | C. Leu | D. Ile | E. Phe | F. Trp |
| G. Pro | H. Ser | I. Thr | J. Pro | K. Tyr | L. Asp |
| M. Asn | N. Glu | O. Gln | P. Lys | Q. Arg | R. His |
| S. Cys | T. Cys-Cys | U. Met | | | |