

CHEM 121 Biological Chemistry Problem Set 1

1. Name the following organic compounds:

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

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

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

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-1pentene
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:

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.  $C_6H_{14}$  plus XS  $O_2$

G.  $C_5H_{12}$  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?