GROUP HOMEWORK #3

CHEM 121, section 1, **Printed Name:** Key

Background and Chp. 13. Introduction to alkenes, alkynes and aromatic compounds

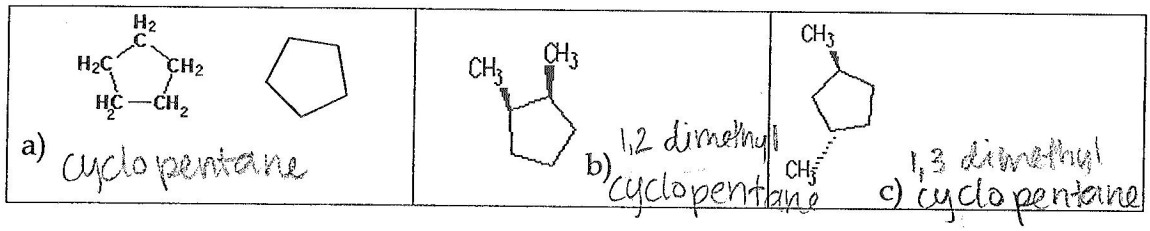
Homework Due **Group Name:**

1) (1 pt) Write the name of names and units of unsaturation for the hydrocarbons (alkane, alkene, alkyne and arene) with followling general formula.

	C_nH_{2n+2}	C_nH_{2n}	C_nH_{2n-2}	C_nH_n
Name	a) alkane	b) alkene	c) alkyne	d) arene
Unit of unsat.	a) 1	b) 1	c) 2	d) 1

2) (2 pts) Draw all constitutional isomers of butane: C_4H_{10}.

3) (2 pts) Names of following cycloalknes:



4) (2 pts) Complete the following reactions of alkanes.

a) Combustion:

i) $C_5H_{12}(g) + 8\,O_2(g) \longrightarrow 5\,CO_2 + 6\,H_2O$

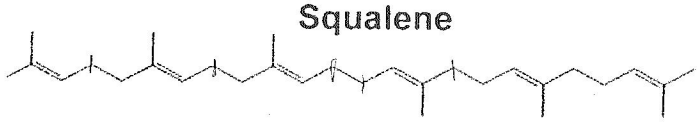
ii) $2\,C_4H_{10}(g) + 13\,O_2(g) \longrightarrow 8\,CO_2(g) + 10\,H_2O(g)$

b) Halogenations: (substitution reaction to form alkyl halides)

$CH_4(g) + Br_2(l) \longrightarrow CH_3Br + HBr$

5) (1 pt) How many isoprene units a in the following natural product?

Squalene



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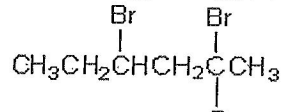
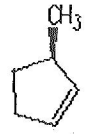
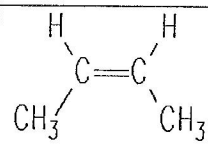
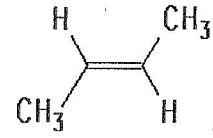
6) (3 pts.) Give common name or/and IUPAC names of following compounds

$CH_3CH_2CH_2CH_2CH_2CH_2CH_3$ a) heptane	 b) 2-methyl propane	 c) 2,2,4-trimethylhexane
$CH_3CH=CH_2$ d) propene	 e) 3-methyl cyclopentene	$CH_3-CH(CH_3)-CH=CH-CH_3$ 4-methyl-2-pentene f)
$CH_3-C\equiv C-CH_2CH_3$ g) 2-pentyne	 h) cis-2-butene	 i) trans-2-butene

7) (2 pts) Complete the reactions of following alkenes

a) $CH_2=CH-CH_3 + H_2 \xrightarrow{Ni}$ $CH_3-CH_2-CH_3$

b) $CH_2=CH-CH_3 + HCl \longrightarrow$ $CH_3-CHCl-CH_3$

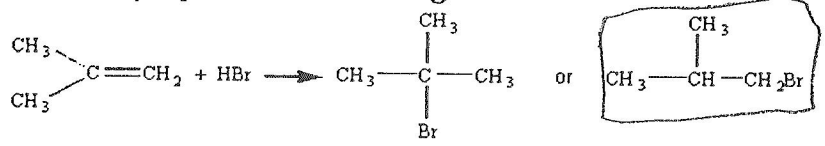
c) $CH_2=CH-CH_3 + H_2O \xrightarrow{H_2SO_4}$ $CH_3\,CH(OH)\,CH_3$

d) $CH\equiv CH + 2H_2 \xrightarrow{Ni}$ CH_3-CH_3

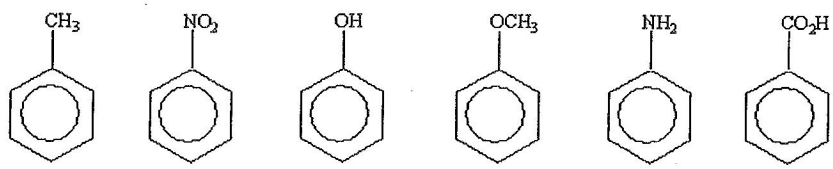
e) $CH_2=CH-CH=CH_2 + H_2 \xrightarrow{Ni}$ $CH_3CH_2\,CH=CH_2$

f) $CH_3CH=CHCH_3 + HBr \longrightarrow$ $CH_3\,CH_2\,CHBr\,CH_3$

g) Pick the major prodcut of following

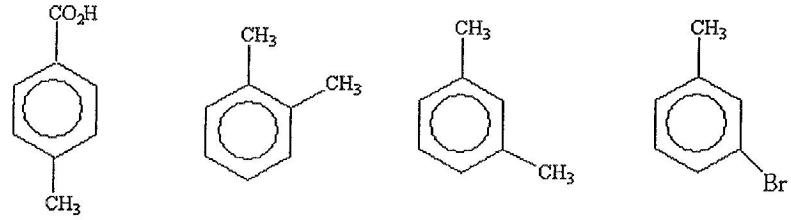


8) (2 pt) Match the following names of aromatic hydrocarbons (arenes) to following structures: Anisole, Aniline, Phenol, Benzoic acid, Toluene, Nitrobenzene.



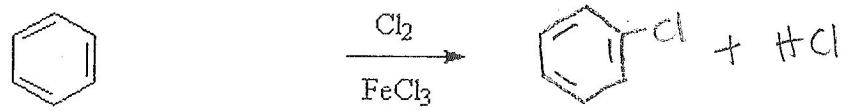
a) Toluene b) Nitrobenzene c) Phenol d) Anisole e) Aniline f) Benzoic acid

9) (2 pt) Give the names of following disubstituted aromatic hydrocarbons.



a) p-3-methyl benzoic acid b) o-xylene c) m-xylene d) m-Bromotoluene

10) (2 pts) Complete the following chemical reactions of aromatic hydrocarbons.

a) 

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