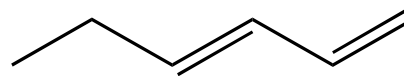


1. (5 points) What is the chemical formula for the molecule $\text{H}_2\text{C}=\text{CH}_2$?

- 1) C_2H 2) C_2H_2 3) C_2H_3 4) C_2H_4 5) C_2H_6

(4) – I hope this was trivially easy!

2. (5 points) What is the chemical formula for the molecule at right?



- 1) C_6H_8 2) C_6H_{10} 3) C_6H_{12} 4) C_6H_{14} 5) C_6H_{16}

(2) $\text{CH}_3\text{-CH}_2\text{-CH=CH-CH=CH}_2$

3. (5 points) What is the functional group in $\text{CH}_3\text{CH}_2\text{OH}$?

- 1) alcohol 2) ketone 3) aldehyde 4) carboxylic acid

(1) alcohol

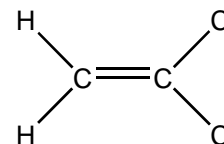
4. (5 points) What is the functional group in CH_3COCH_3 ?

- 1) alcohol 2) ketone 3) aldehyde 4) carboxylic acid 5) ether

(2) ketone - the trick is to complete the octet around carbon 2. What do you have to do to achieve an octet?

5. (5 points) The molecule at right is

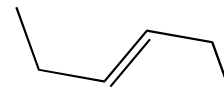
- 1) a cis isomer 2) a trans isomer 3) not an isomer



(3) not an isomer

6. (5 points) The molecule at right is

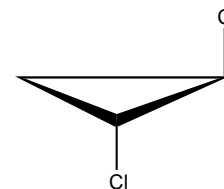
- 1) a cis isomer 2) a trans isomer 3) not an isomer



(2) trans – with respect to the double bond

7. (5 points) The molecule at right is

- 1) a cis isomer 2) a trans isomer 3) not an isomer



(2) trans – with respect to the cyclic ring

8. (5 points) In the molecule at right the hydroxyl is in what position?



- 1) axial 2) equatorial 3) cis 4) trans

(2) equatorial

9. (5 points) Which molecule below is more reactive, in general?



octane



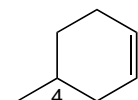
trans, trans-2,6-octadiene

- 1) octane 2) trans,trans-2,6-octadiene 3) they have the same reactivity

(2) addition reactions are possible only for the diene

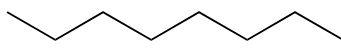
10. (5 points) In the molecule at right, the ideal bond angle around the 4-carbon is:

- 1) 120° 2) 109° 3) 90° 4) 180°

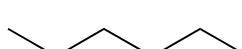


(2) 109° It's sp³ - OWL 12.1a

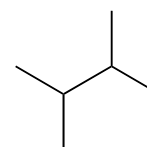
11. (5 points) Which molecule below has the lowest boiling point?



octane



hexane

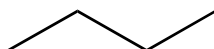


2,3-dimethylbutane

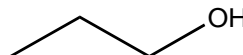
- 1) octane 2) hexane 3) 2,3-dimethylbutane

(3) it's branched, so does not associate with itself well

12. (5 points) Which molecule below has the lowest boiling point?



butane

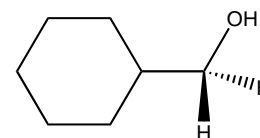


1-propanol

- 1) butane 2) 1-propanol

(1) the hydroxyl group of propanol allows for more self association, so harder to put into gas phase

13. (5 points) In the molecule at right, the alcohol is classified as:

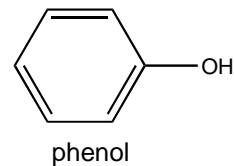
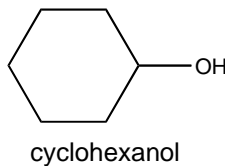


- 1) primary 2) secondary 3) tertiary

(1) primary

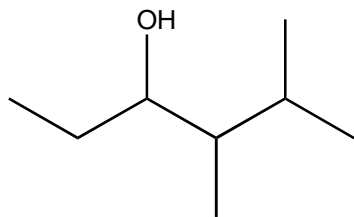
14. (5 points) Which is the stronger acid?

- 1) cyclohexanol
- 2) phenol
- 3) they are the same

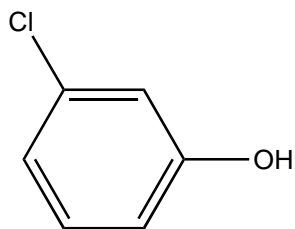


(2) alcohols are terrible acids, except for phenol. Because of resonance, phenol can delocalize the charge on the deprotonated species. Cyclohexanol cannot.

15. (15 points) Draw the structure for 4,5-dimethyl-3-hexanol



16. (15 points) Draw the structure for 3-chlorophenol



17. What is the catalog number for this class?

- 1) 111 2) 250 3) 86 4) 345 5) 68.6 g

(2)