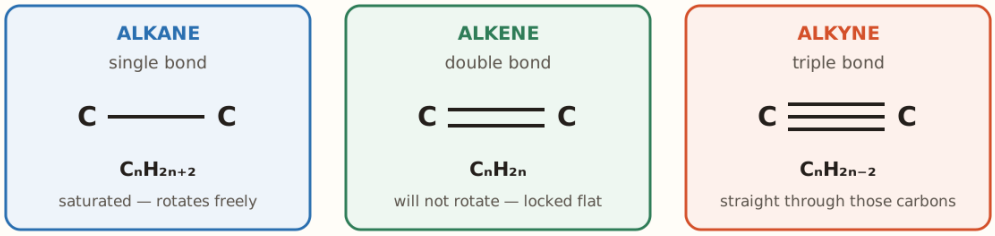
Alkenes and Alkynes Worksheet

Grade 11 Chemistry · naming, formulas and the double bond

Name: Date: Score: / 22

One Family, Three Levels of Saturation



Number the chain from whichever end puts the multiple bond on the lower carbon.

Before you start: number the chain from whichever end gives the multiple bond the lower number. Only write the number when more than one position is possible — ethene and propene do not need one.

Part A · name it and give the molecular formula

#	Structure	IUPAC name	Formula
1	2 carbons, double bond starting at carbon 1		
2	3 carbons, double bond starting at carbon 1		
3	4 carbons, double bond starting at carbon 1		
4	4 carbons, double bond starting at carbon 2		
5	5 carbons, double bond starting at carbon 2		
6	6 carbons, double bond starting at carbon 3		
7	2 carbons, triple bond starting at carbon 1		
8	3 carbons, triple bond starting at carbon 1		
9	4 carbons, triple bond starting at carbon 1		
10	5 carbons, triple bond starting at carbon 2		
11	6 carbons, triple bond starting at carbon 1		
12	8 carbons, double bond starting at carbon 4		

Part B · alkane, alkene or alkyne?

#	Formula	Family, and the general formula it fits
13	C_3H_8	
14		

#	Formula	Family, and the general formula it fits
	C_4H_8	
15	C_5H_8	
16	C_6H_{14}	
17	C_2H_4	
18	C_7H_{12}	

Part C · explain

19. Why can a carbon–carbon double bond not rotate freely?

20. Why do alkenes decolourise bromine water but alkanes do not?

21. What is the smallest alkyne, and why is there no methyne?

22. Why does but-1-ene have an isomer but ethene does not?

Answer Key

Alkenes and Alkynes · Grade 11 Chemistry

Part A

#	Structure	Name	Formula
1	2 C, double at C1	**ethene**	C_2H_4
2	3 C, double at C1	**propene**	C_3H_6
3	4 C, double at C1	**1-butene**	C_4H_8
4	4 C, double at C2	**2-butene**	C_4H_8
5	5 C, double at C2	**2-pentene**	C_5H_{10}
6	6 C, double at C3	**3-hexene**	C_6H_{12}
7	2 C, triple at C1	**ethyne**	C_2H_2
8	3 C, triple at C1	**propyne**	C_3H_4
9	4 C, triple at C1	**1-butyne**	C_4H_6
10	5 C, triple at C2	**2-pentyne**	C_5H_8
11	6 C, triple at C1	**1-hexyne**	C_6H_{10}
12	8 C, double at C4	**4-octene**	C_8H_{16}

Part B

#	Formula	Family
13	C_3H_8	**alkane** — fits CnH2n+2
14	C_4H_8	**alkene** — fits CnH2n
15	C_5H_8	**alkyne** — fits CnH2n-2
16	C_6H_{14}	**alkane** — fits CnH2n+2
17	C_2H_4	**alkene** — fits CnH2n
18	C_7H_{12}	**alkyne** — fits CnH2n-2

Part C

19. **Why can a carbon–carbon double bond not rotate freely?**
    The pi bond is formed by sideways overlap above and below the axis. Rotating would break that overlap, so the two ends are locked.

20. **Why do alkenes decolourise bromine water but alkanes do not?**
    The double bond adds bromine across it without needing light or heat. An alkane has no such bond and only reacts by substitution.

21. **What is the smallest alkyne, and why is there no methyne?**
    Ethyne, C2H2. A triple bond needs two carbons to share it, so one carbon cannot form one.

22. **Why does but-1-ene have an isomer but ethene does not?**
    With four carbons the double bond can sit between C1 and C2 or between C2 and C3. With two carbons there is only one possible position.