

Sniffing Around Molecular Formulas

Name _____

Date _____ Period _____

Purpose

To explore the connection between chemistry and smell.

Materials

- vials A–E

Part 1: Smelling

Smell the five mystery smells in vials A–E using the wafting technique. Replace the caps immediately after smelling and take care not to mix them up.

1. Identify the smells yourself as either fishy, minty, or sweet. Then discuss the smells as a group and reach consensus on the smell classification.

Vial	Your classification	Group consensus
A		
B		
C		
D		
E		

Part 2: Looking for Patterns

1. Enter the group consensus smells in the smell data table.

Smell Data

Vial	Smell	Chemical name	Molecular formula
A		L-carvone	$C_{10}H_{14}O$
B		phenylethylamine	$C_8H_{11}N$
C		pentyl propionate	$C_8H_{16}O_2$
D		isopentyl acetate	$C_7H_{14}O_2$
E		menthone	$C_{10}H_{18}O$

2. Look for patterns in the data. Write down at least eight patterns you discover between your data and the various smells.

Questions

1. Why do you think there are sometimes disagreements over how to classify smells?
2. From the data, what generalization could you make about substances that contain oxygen atoms?
3. Which patterns might be useful in helping you predict smells?
4. **Making Sense** What evidence is there that smell, molecular formula, and chemical name are related?