

Key

Challenge Problem

Unit: The Periodic Table (ALT 1)

The following information concerns six **consecutive elements** in the periodic table. Study the information carefully and then identify each element. Use the **real** elemental symbols and the fictitious symbols.

Element A is a highly diatomic gas at room temperature. It combines with element B to form a compound B_2A .

Element B reacts with water to produce heat and causes rapid movement across the surface of the water. Element B reacts with element F to form the compound BF.

Element C is a diatomic gas at room temperature. 22.4 liters of the gas at 0°C and a pressure of 1.0 atmospheres weighs 28.0 grams.

$$28 \div 2 = 14.0g \Rightarrow N$$

Element D is a gas that does not form compounds with anything.

Element E is a nonmetal appearing solid that conducts electricity moderately. It combines with element A to form common compounds EA and EA_2 . EA is a toxic gas emitted by cars. EA_2 is emitted by you.

Element F exists as a diatomic gas at room temperature. It is the most reactive nonmetal of all the elements in this question.

A O B Na C N D Ne E C F F

We know element C is N so elements A-F must be six of these in order & including N.



Element A
diatomic gas \Rightarrow ~~O~~ F

Element B
reacts w/ water \Rightarrow ~~Li, Na, Mg~~

Element D
gas, no compounds \Rightarrow ~~He, Ne~~

Element E
non-metal solid \Rightarrow C
common compounds CO_2, CO

Element F
diatomic gas \Rightarrow ~~O~~ F
most reactive non-metal