

ConceptTests on Chemical Bonding

ConceptTest designed to test bond types:

Dihydrogen sulfide (H_2S) is a foul-smelling gas produced when eggs and other sulfur-containing materials decompose. (Its nickname is “rotten egg gas.” The bonds in this molecule are

1. ionic bonds.
2. polar covalent bonds.
3. nonpolar covalent bonds.
4. hydrogen bonds.

Correct Answer: 2. polar covalent bonds.

Comment to Instructor: The students should be able to recognize that the correct response is #2, since the molecule has bonds between two different nonmetals. they may recognize this as an acid and think that #1 is correct, or think that anything that contains H must be held together by hydrogen bonds (confusing intermolecular with intramolecular forces) and choose #4.

ConceptTest designed to test a student's understanding of bond types:

You overhear someone saying “a molecule of calcium chloride contains one atom of calcium bonded to one molecule of chlorine.” Knowing that this statement is incorrect, you say to the person, “Not to be nosy, but I overheard what you said, and it’s not a correct statement because...”

1. there are two atoms of chlorine present, not one molecule.”
2. calcium chloride is ionic, so you should have said that a molecule of calcium chloride consists of one calcium ion and two chlorine ions.”
3. calcium chloride is ionic, so it doesn’t consist of molecules at all. The correct statement would be that ‘a formula unit of calcium chloride consists of one calcium ion and two chloride ions.’”
4. the formula for calcium chloride is Ca_2Cl .”

Correct Answer: #3

Comment to Instructor: Students often don't have a clear understanding of the differences between atoms, molecules, and ions, and that two atoms of something are not the same thing as a diatomic molecule! The correct response indicates that the original statement has a lot of problems, the most fundamental of which is that they didn't realize that ionic compounds don't consist of molecules. Choosing #1 or #2 shows that they realize some of the problems, but not all of them. Those who choose #4 need to review nomenclature!
