

Chemistry

How do you distinguish between ionic, polar covalent, and nonpolar covalent?

As discussed in Module #2, you can tell the difference between an ionic and covalent compound by looking for metals in the chemical formula. If there is a metal (left side of the jagged line on the periodic chart) in the compound, it is an ionic compound. If there are only non-metals (right side of the jagged line on the periodic chart), it is a covalent compound. NaNO_3 , then, is ionic while NH_3 is covalent.

As discussed in Module #5, to determine whether or not a molecule is polar covalent or nonpolar covalent, you need to look at two things:

1. If there is only one element in the molecule (O_2 , Br_2 , O_3 , etc.) then the molecule is purely covalent.
2. If there is more than one element in the molecule, the molecule has polar bonds, but may not be a polar covalent molecule. To determine whether or not it is polar, you must draw the Lewis structure and then determine the molecular geometry. If the molecular geometry allows the polar bonds to cancel out, such as in the linear geometry of CO_2 or the tetrahedral geometry of CH_4 , then the molecule is nonpolar covalent. If the geometry does not allow the polar bonds to cancel, such as the pyramidal geometry of NH_3 or the bent geometry of H_2O , then the molecule is polar covalent.

Unique solution ID: #1035

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Last update: 2019-01-29 20:53