

# Which Type of Bond?

Elements that form discrete covalent molecules or monatomic "molecules" (M.P. and B.P. is governed by intermolecular van der Waal forces only)

<b>H<sub>2</sub></b>																																				<b>He</b>																																															
																																										<b>N<sub>2</sub></b>						<b>O<sub>2</sub></b>						<b>F<sub>2</sub></b>						<b>Ne</b>																							
																																										<b>P<sub>4</sub></b>						<b>S<sub>8</sub></b>						<b>Cl<sub>2</sub></b>						<b>Ar</b>																							
																																																						<b>Br<sub>2</sub></b>						<b>Kr</b>																							
																																																																		<b>I<sub>2</sub></b>						<b>Xe</b>											
																																																																								<b>At<sub>2</sub></b>						<b>Rn</b>					

Elements that are capable of creating covalent network solids (add (SiO<sub>2</sub>)<sub>n</sub> to this list) (M.P. and B.P. is governed by intramolecular covalent bonds within a macromolecule and as such is very high)

<b>H<sub>2</sub></b>																																				<b>He</b>																																																																	
																																										<b>B</b>						<b>C</b>						<b>N<sub>2</sub></b>						<b>O<sub>2</sub></b>						<b>F<sub>2</sub></b>						<b>Ne</b>																													
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																																																												<b>Ge</b>						<b>As</b>						<b>Se</b>						<b>Br<sub>2</sub></b>						<b>Kr</b>																	
																																																																		<b>Sn</b>						<b>Sb</b>						<b>Te</b>						<b>I<sub>2</sub></b>						<b>Xe</b>											
																																																																														<b>Bi</b>						<b>Po</b>						<b>At<sub>2</sub></b>						<b>Rn</b>					

The elements with the lightest shading are molecular liquids and solids bound by van der Waals forces. The elements with medium shading are covalently bonded network solids. The metallic elements are indicated by the darkest shading.

<b>H<sub>2</sub></b>																																				<b>He</b>					
<b>Li</b>		<b>Be</b>																<b>B</b>		<b>C</b>		<b>N<sub>2</sub></b>		<b>O<sub>2</sub></b>		<b>F<sub>2</sub></b>		<b>Ne</b>													
<b>Na</b>		<b>Mg</b>																<b>Al</b>		<b>Si</b>		<b>P<sub>n</sub>*</b>		<b>S<sub>8</sub></b>		<b>Cl<sub>2</sub></b>		<b>Ar</b>													
<b>K</b>		<b>Ca</b>		<b>Sc</b>		<b>Ti</b>		<b>V</b>		<b>Cr</b>		<b>Mn</b>		<b>Fe</b>		<b>Co</b>		<b>Ni</b>		<b>Cu</b>		<b>Zn</b>		<b>Ga</b>		<b>Ge</b>		<b>As</b>		<b>Se</b>		<b>Br<sub>2</sub></b>		<b>Kr</b>							
<b>Rb</b>		<b>Sr</b>		<b>Y</b>		<b>Zr</b>		<b>Nb</b>		<b>Mo</b>		<b>Tc</b>		<b>Ru</b>		<b>Rh</b>		<b>Pd</b>		<b>Ag</b>		<b>Cd</b>		<b>In</b>		<b>Sn</b>		<b>Sb</b>		<b>Te</b>		<b>I<sub>2</sub></b>		<b>Xe</b>							
<b>Cs</b>		<b>Ba</b>		<b>La-Lu</b>		<b>Hf</b>		<b>Ta</b>		<b>W</b>		<b>Re</b>		<b>Os</b>		<b>Ir</b>		<b>Pt</b>		<b>Au</b>		<b>Hg</b>		<b>Tl</b>		<b>Pb</b>		<b>Bi</b>		<b>Po</b>		<b>At<sub>2</sub></b>		<b>Rn</b>							
<b>Fr</b>		<b>Ra</b>		<b>Ac-Lr</b>																																					

\*Phosphorus has several different molecular forms. Volatile white phosphorus is P<sub>4</sub>. Non-volatile, insoluble red phosphorus is polymeric P<sub>n</sub>.