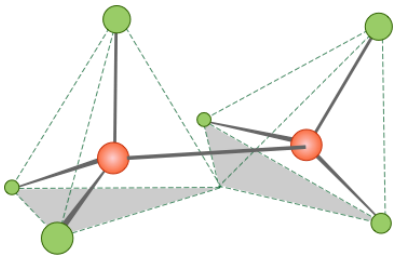
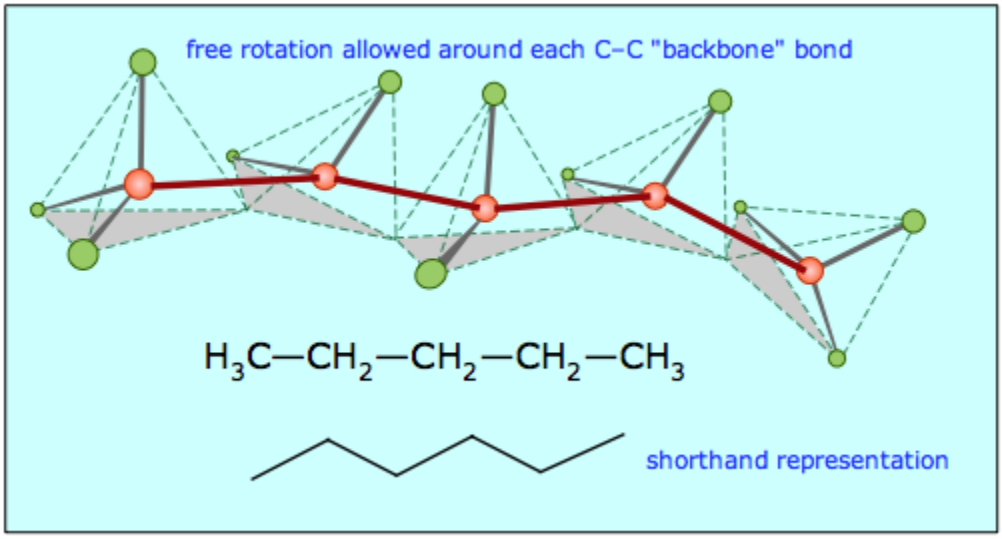
TETRAHEDRALLY-COORDINATED CARBON CHAINS

Carbon atoms are well known for their tendency to link together to form the millions of organic molecules that are known. We can work out the simpler hydrocarbon chains by looking at each central atom separately. Thus the hydrocarbon ethane is essentially two CH3 tetrahedra joined end-to-end. Similar **alkane** chains having the general formula H3C–(CH2)n–CH3 (or CnH2n+2) can be built up; a view of pentane, C5H12, is shown below.





Notice that these "straight chain hydrocarbons" (as they are often known) have a carbon "backbone" structure that is not really straight, as is illustrated by the zig-zag figure that is frequently used to denote hydrocarbon structures.

Coordination geometry and molecular geometry

Coordination number refers to the number of electron pairs that surround a given atom; we often refer to this atom as the central atom even if this atom is not really located at the geometrical center of the molecule.

If all of the electron pairs surrounding the central atom are shared with neighboring atoms, then the **coordination geometry** is the same as the **molecular geometry**.

The application of VSEPR theory then reduces to the simple problem of naming (and visualizing) the geometric shapes associated with various numbers of points surrounding a central point (the central atom) at the greatest possible angles.

Both classes of geometry are named after the shapes of the imaginary geometric figures (mostly regular solid polygons) that would be centered on the central atom and would have an electron pair at each vertex.

If one or more of the electron pairs surrounding the central atom is not shared with a neighboring atom (that is, if it is a lone pair), then the molecular geometry is simpler than the coordination geometry, and it can be worked out by inspecting a sketch of the coordination geometry figure.

Source: http://www.chem1.com/acad/webtext/chembond/cb05.html