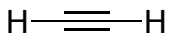
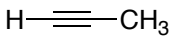
Nomenclature of Alkynes

Rules:

- Find longest chain with max number of multiple bonds
- Number from end to give 1st multiply bonded position the lowest number
- Drop "ane" and add "yne"
- For multiple triple bonds, drop "ne" and add "diyne"," triyne", etc.

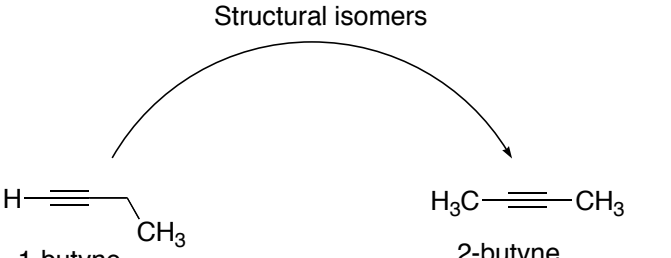


ethyne
acetylene



propyne

methylacetylene (common name)



1-butyne

ethylacetylene

2-butyne

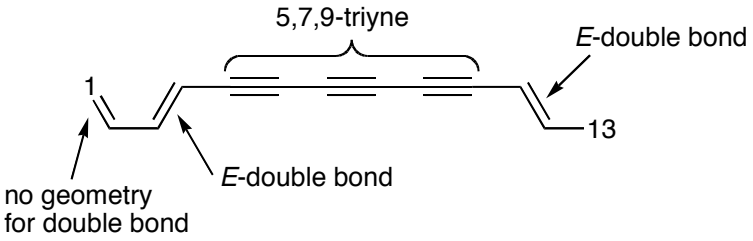
dimethylacetylene

Multiple alkynes end with:

2	C≡C	diyne
3	C≡C	triyne
4	C≡C	tetrayne

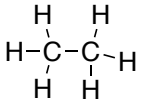
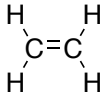
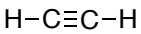
Mixed double and triple bond containing compounds are "eneynes"

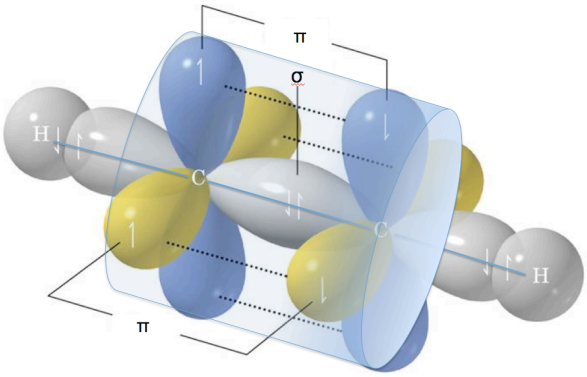
The below example is from canola – defense substance (anti-nematode)



3*E*,11*E*-trideca-1,3,11-triene-5,7,9-triyne

Structure and Orbital hybridization of Alkynes (compared to Alkanes and Alkenes)

			
C-C (Å)	1.54	1.33	1.20
C-H (Å)	1.09	1.08	1.06
Hybridization	sp^3	sp^2	*sp*
% s-character	25	33	50
Reactivity			
mp (°C)	-183	-169	~ -80
bp (°C)	-164	-104	~ -80
Density (g/cm^3)	0.55	0.51	0.62

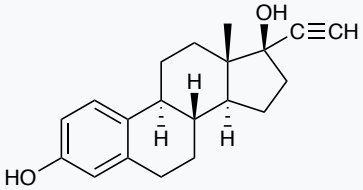


Hybridization in alkynes:
2 *sp*-hybrid orbitals
2 unhybridized π-orbitals

Physical properties of Alkenes and Alkynes

-Good solubility in organic solvents e.g. acetone, $CHCl_3$
-Higher mp and bp than Alkanes (see table above)

Occurrence of Alkenes and Alkynes (mainly incl. in Natural Products)

- Growth factor in plants: ethylene
- Hormone/Pheromones:  **ethynyl estradiol**