

Organic Chemistry 212

Prof J. Walker

Notes: *Chapter Four - Benzene and Its Derivatives*

Classes of Hydrocarbons

Aliphatic

Alkanes

Alkenes

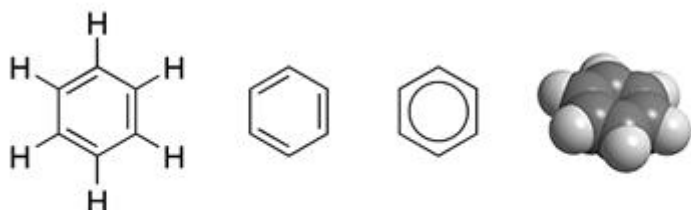
Alkynes

Aromatic

Arenes

Symbols: **R** means an aliphatic hydrocarbon chain and **Ar** means an aryl group (a benzene ring with one H removed)

Benzene: C_6H_6



What is a resonance structure?

Nomenclature

Write structures for these common aromatic molecules:

Toluene

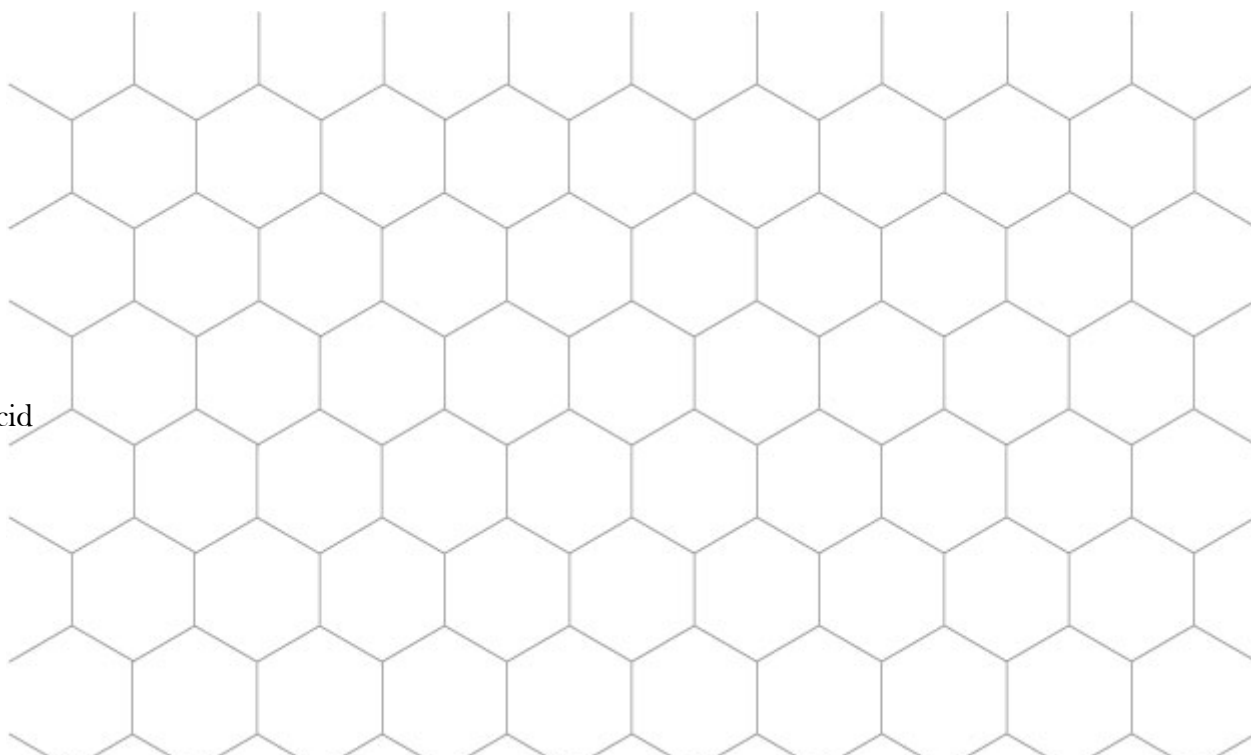
Styrene

Phenol

Anisole

Aniline

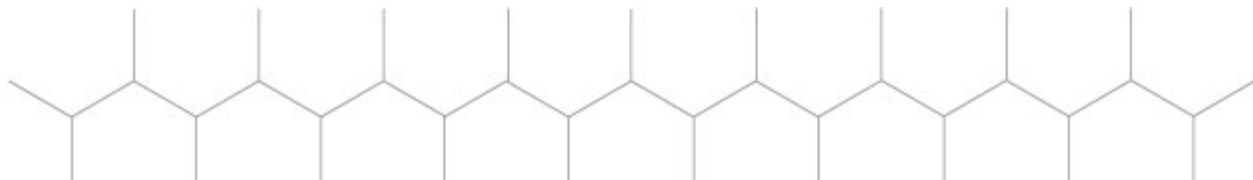
Benzoic Acid



Explain what is meant by ortho (o), meta (m) and para (p) when naming aromatic hydrocarbons.

Polynuclear Aromatic Hydrocarbons: Draw structures for the following molecules:

Naphthalene



Anthracene



What is a carcinogen?

Characteristic Reactions:

Give an example of halogenation:



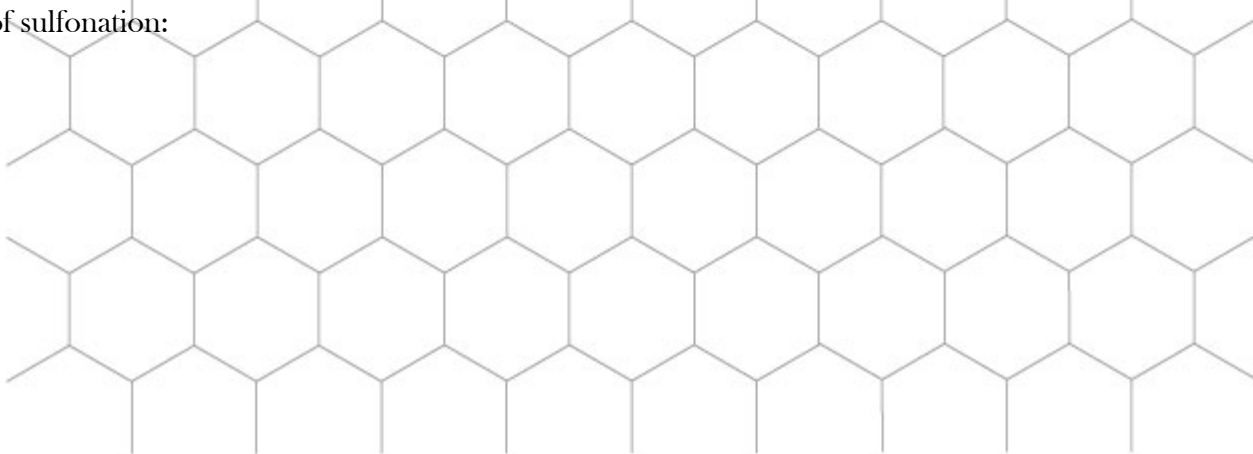
Give an example of nitration:

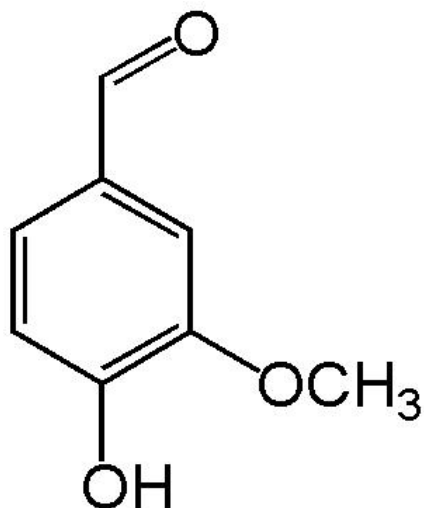


Draw the structure for T.N.T. What is the meaning of the acronym T.N.T.?



Give an example of sulfonation:





Vanillin:

What functional groups can you identify on this molecule?

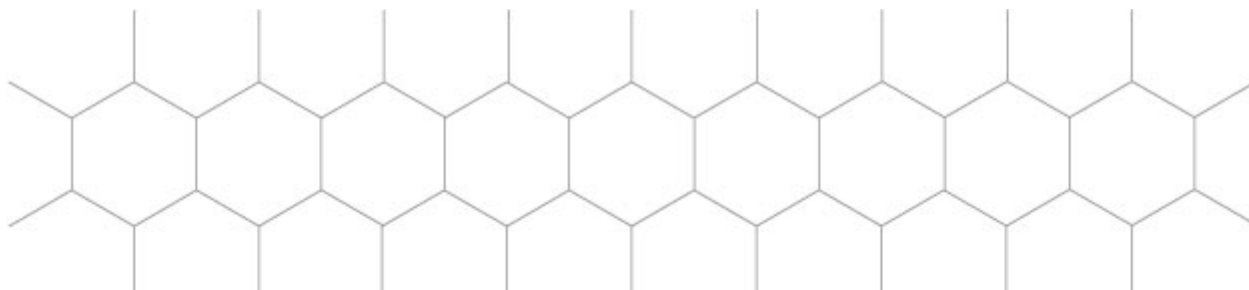
What is the formal name for vanillin?

What is the molecular formula for vanillin?

What is a typical use for this molecule?

What class contains this molecule?

Describe three other members of this class and draw their structures:



What is a radical? Draw a Lewis Dot Structure for the oxygen diradical.

What evidence suggests that oxygen exists as a triplet diradical?

Autooxidation is a radical-chain process that converts an **R-H** group to an **R-O-O-H** group, called a hydroperoxide. Show the mechanism (Step 1, Step 2a and Step 2b) for this process.

