

3.14

Polycyclic Ring Systems

contain more than one ring

bicyclic

tricyclic

tetracyclic

etc

Types of Ring Systems

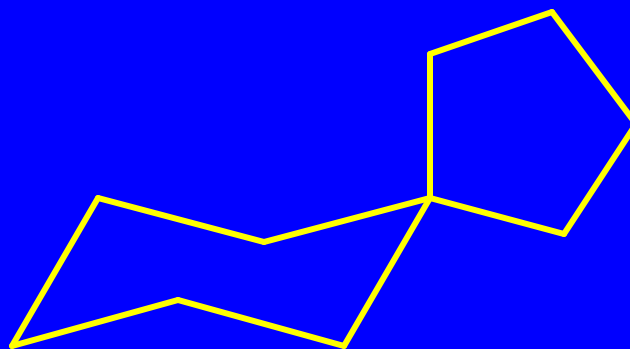
spirocyclic

fused ring

bridged ring

Spirocyclic

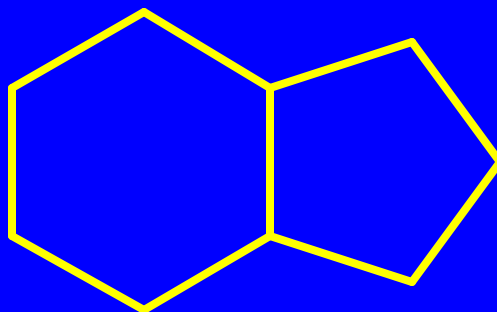
one atom common to two rings



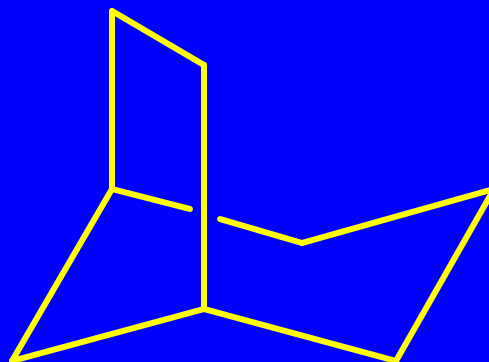
Fused Ring

adjacent atoms common to two rings

two rings share a common side



Bridged Ring



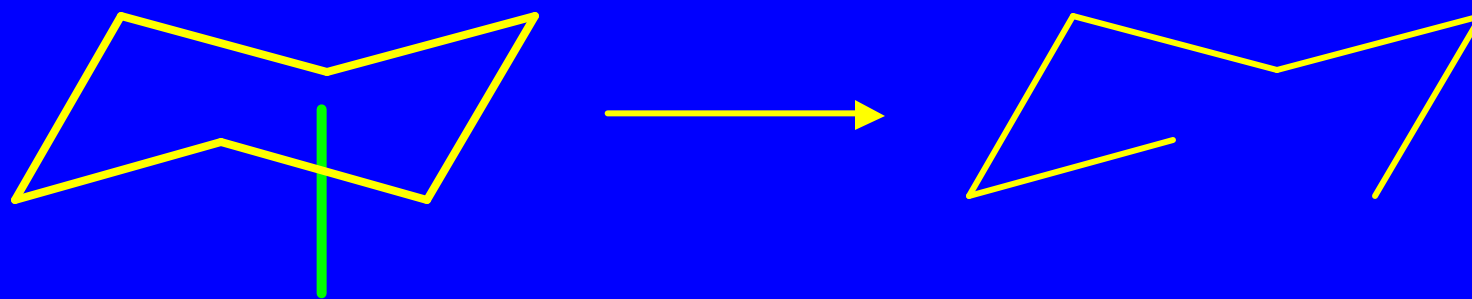
nonadjacent atoms common to two rings

Number of Rings

equals minimum number of bond disconnections required to give a noncyclic species

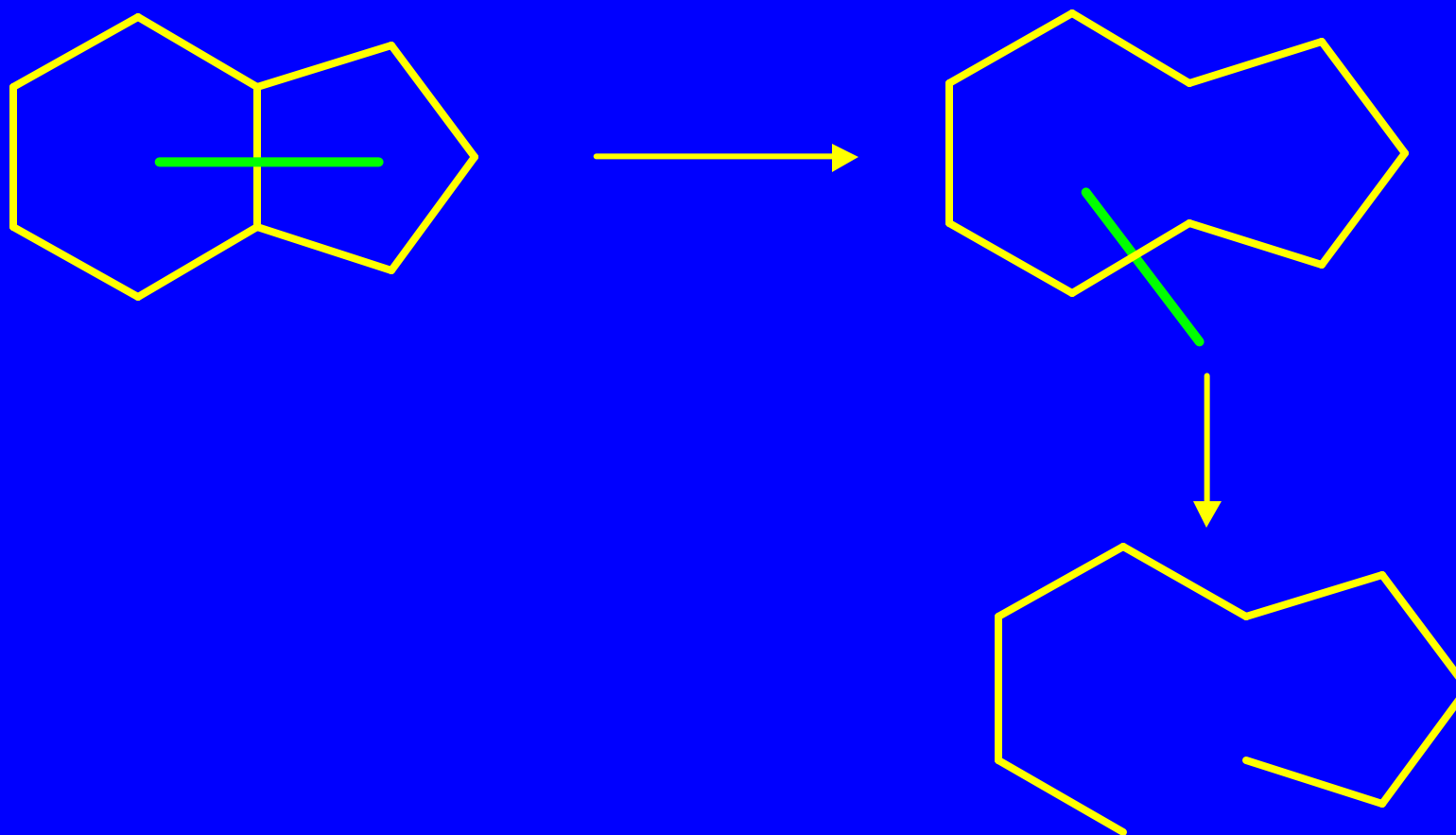
Monocyclic

requires one bond disconnection



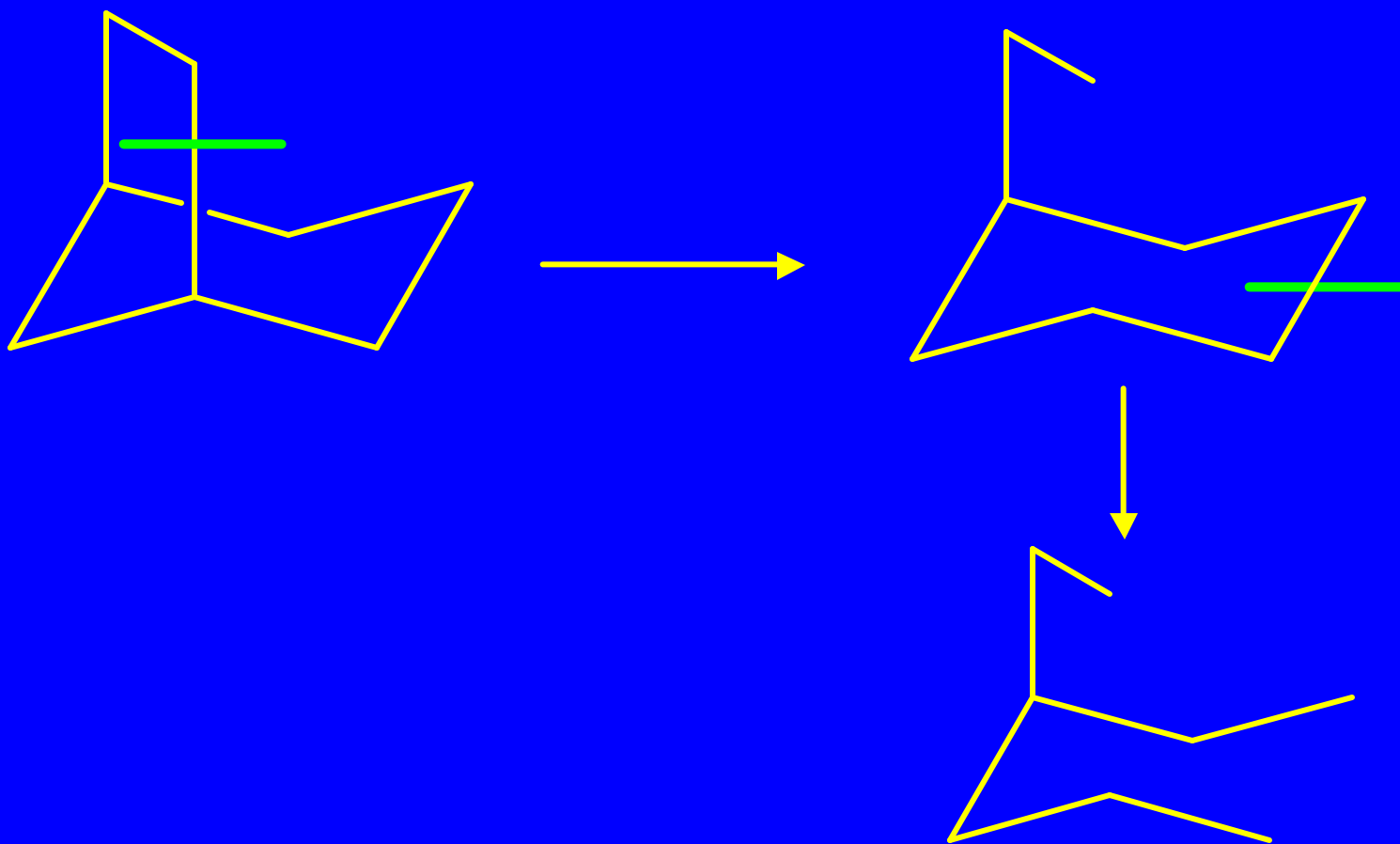
Bicyclic

requires two bond disconnections



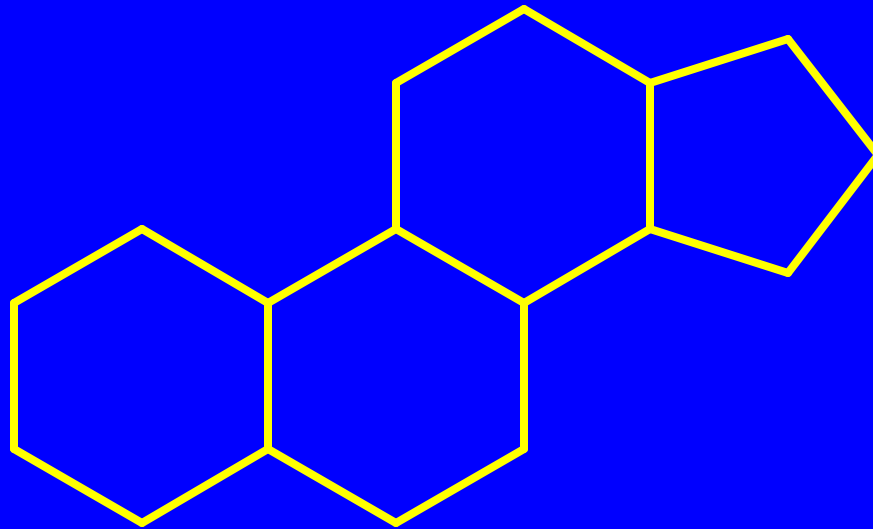
Bridged Bicyclic

requires two bond disconnections



Steroids

carbon skeleton is tetracyclic



3.15

Heterocyclic Compounds

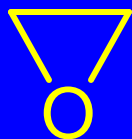
Heterocyclic Compound

a cyclic compound that contains an atom other than carbon in the ring

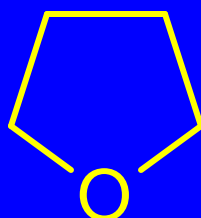
(such atoms are called heteroatoms)

typical heteroatoms are N, O, and S

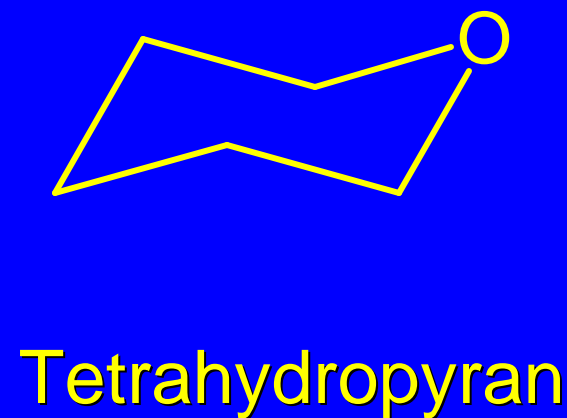
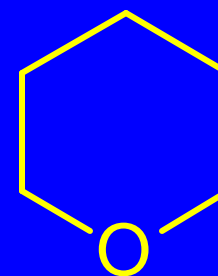
Oxygen-containing Heterocycles



Ethylene
oxide

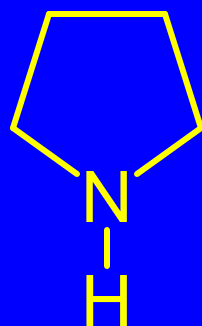


Tetrahydrofuran

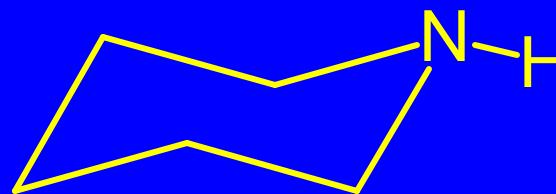


Tetrahydropyran

Nitrogen-containing Heterocycles



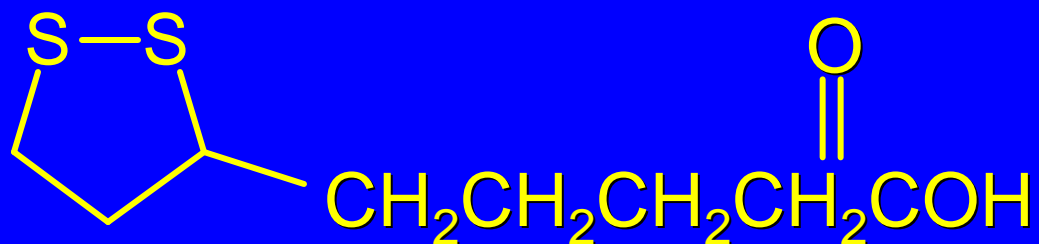
Pyrrolidine



Piperidine

Sulfur-containing Heterocycles

Lipoic acid



Lenthionine

