

Answers to Ch1 Problems

*Please only use these to check **your** answers – there is no better way to get good at organic problems than trying to do them yourself.*

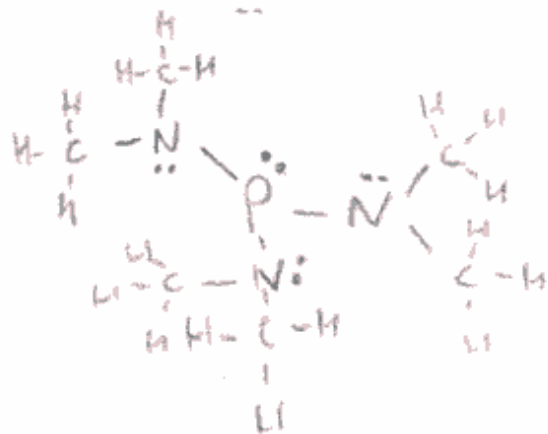
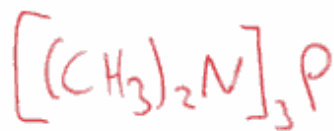
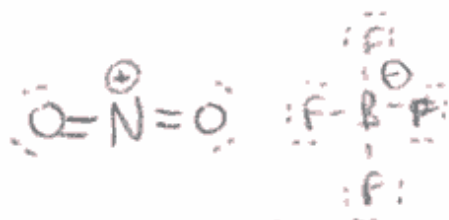
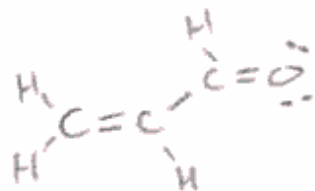
The struggle to figure out the right answer is training you to be able to answer the questions on examinations.

Being lazy and cheating yourself by not attempting these problems yourself will cause you to do horribly on my quizzes and exams.

BEAR IN MIND, the problems are VERY relevant to the text they follow. E.g. if we cover Resonance Structures, the problems directly after that in the text ***MAY involve something that depends on resonance stabilization.***

(If you are stuck, read the section in the notes directly before that problem).

Draw Lewis structures for

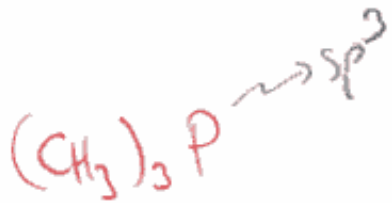
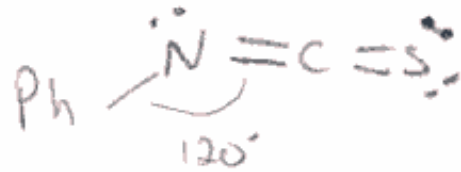
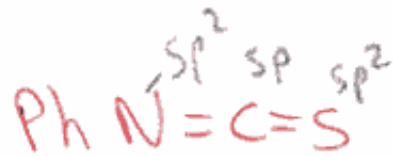
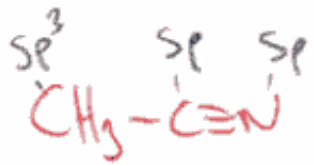


= hmpa

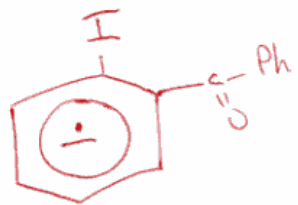
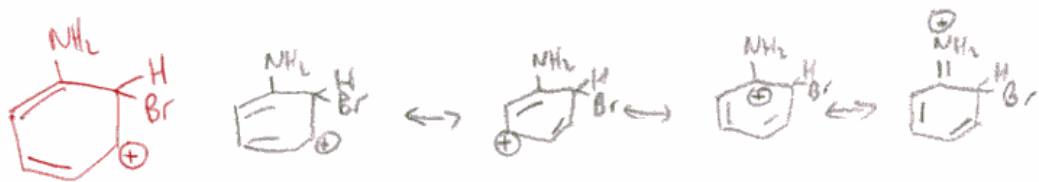
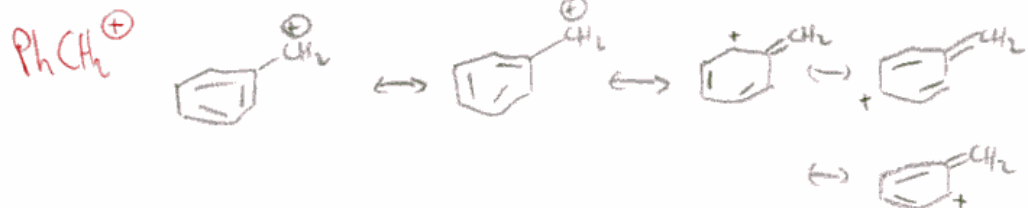
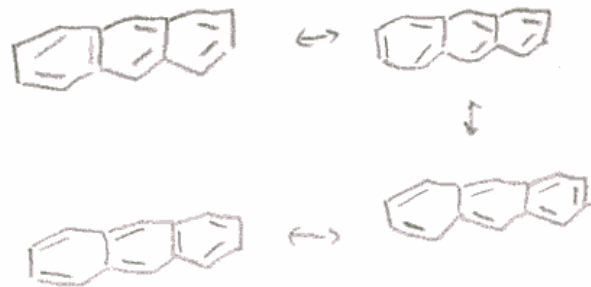
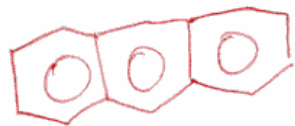
= hexamethylphosphoramide

= v. polar solvent/additive.

Predict Hybridization & Geometry for:



Draw Resonance Structures for:

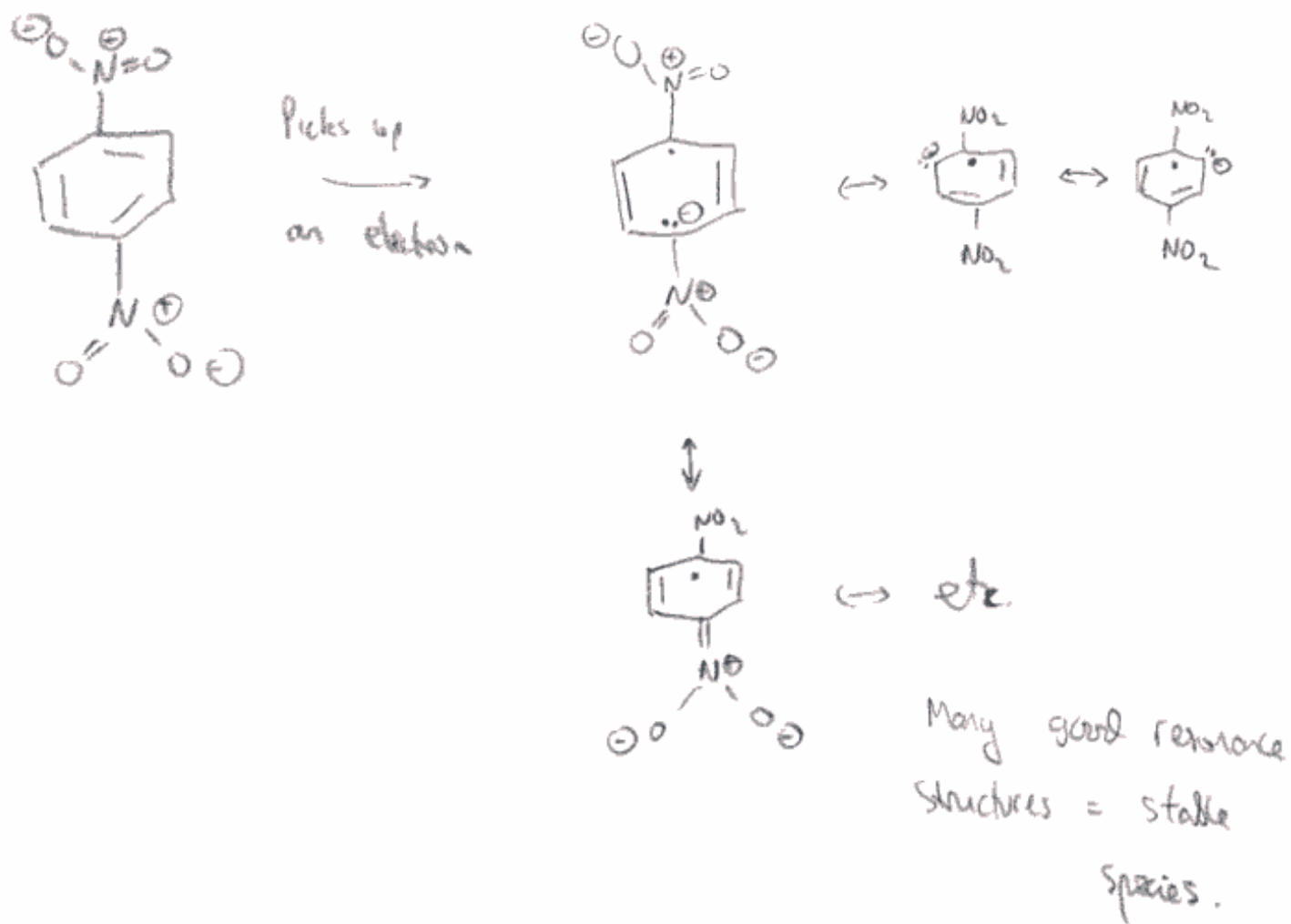


MANY, MANY ...

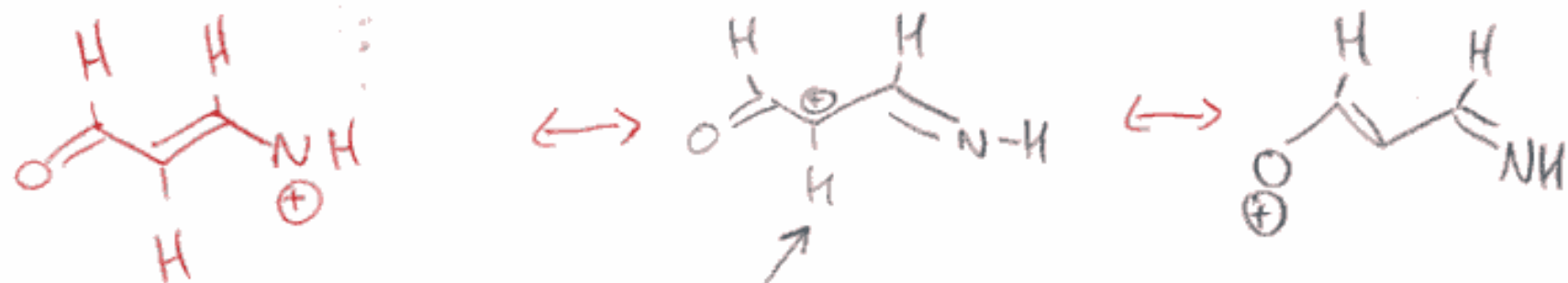


Para-dinitrobenzene = "radical trap" used to inhibit free radical reactions.

Why is it so good at 'picking up' an electron?



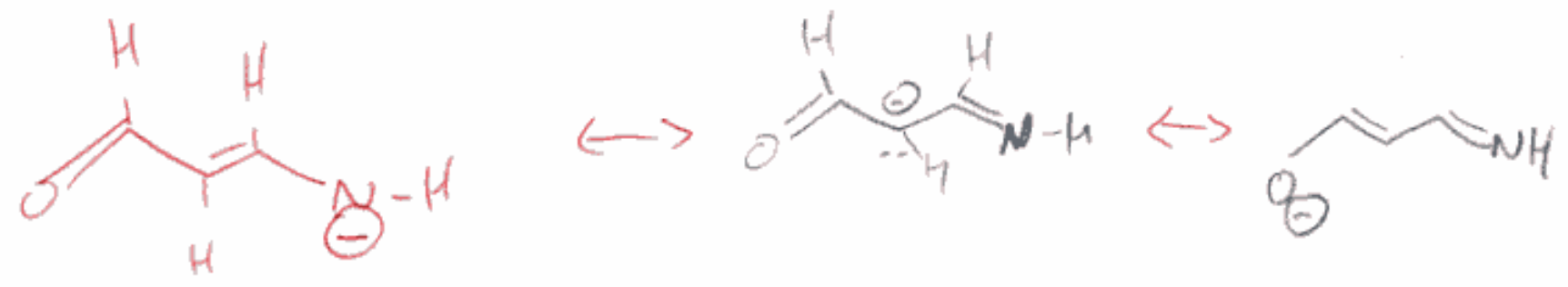
Write two more resonance structures for:



Which is the most stable & why?

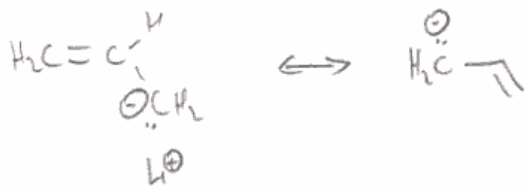
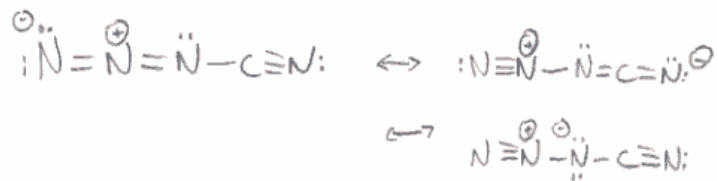
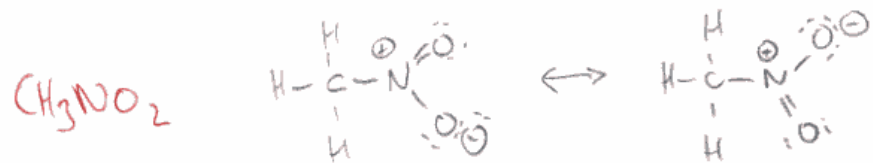
+ve charge on least Electronegative Element.

What about for?



↑
Most stable, -ve
Charge on most Electronegative
Element.

Write good Lewis structures for the following & any significant resonance forms.



Aromatic, antiaromatic or non-aromatic?



6 π Aromatic



Non Aromatic (acyclic)



8 π AntiAromatic (if planar)



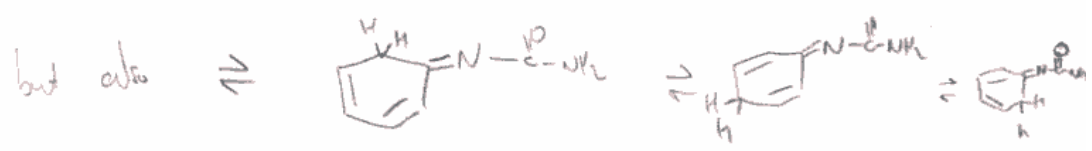
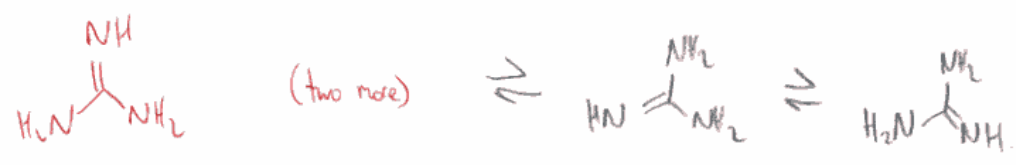
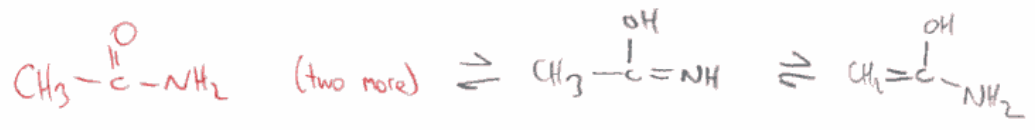
Non Aromatic (sp^3 atom in ring)



16 π = AntiAromatic (if planar)

(Counts as 2 π towards aromaticity)

Write tautomers of the following compounds.



Tautomers, resonance or same?



&



Different

&



different

&



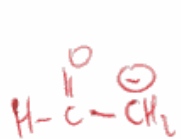
different

&

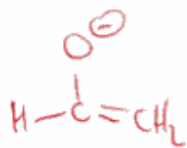


same compound

(could argue that they are tautomers if you believe the H is sufficiently acidic.)



&



Resonance.



&



Tautomers.

Is this 'correct'?

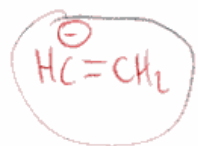


If "NO", what should be changed?

No, not resonance, but tautomers.

∴ replace \leftrightarrow with \rightleftharpoons .

Which is the stronger base?



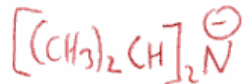
or



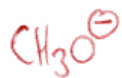
anion in sp
∴ more stable



or



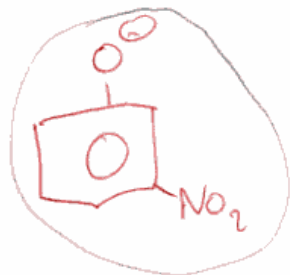
resonance
stabilized



or

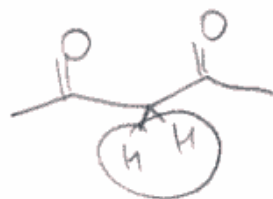
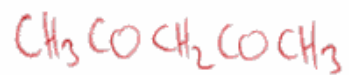


or



better
resonance
stabilized

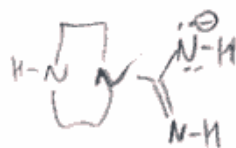
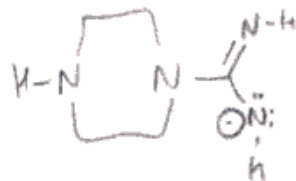
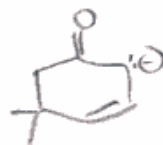
Which proton is most likely to be removed with base?



resonance
stabilized
anion



-ve charge on most electronegative atom



Indicate the Electrophilic & Nucleophilic sites in these reactions.

