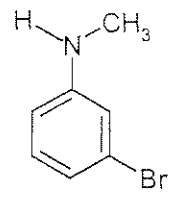


1. (1 pt) Which compound undergoes autooxidation most readily?

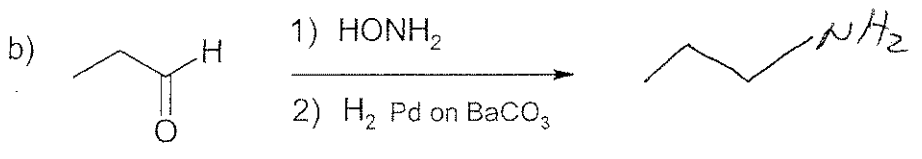
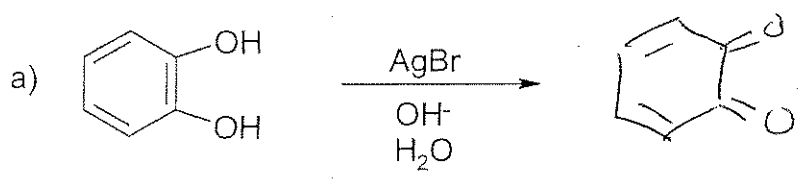
- a) benzene **b) ethanal** c) cyclohexane d) acetic acid

2. (2 pts) Give the IUPAC name of the following compound:

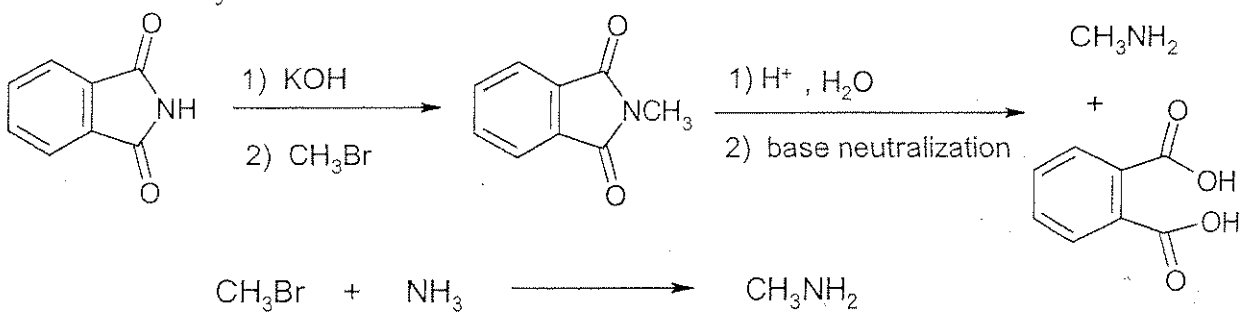


N-methyl-3-bromoaniline

3. (6 pts, 3 each pts) Give structures for the **major product** or reagents needed for the following transformations.



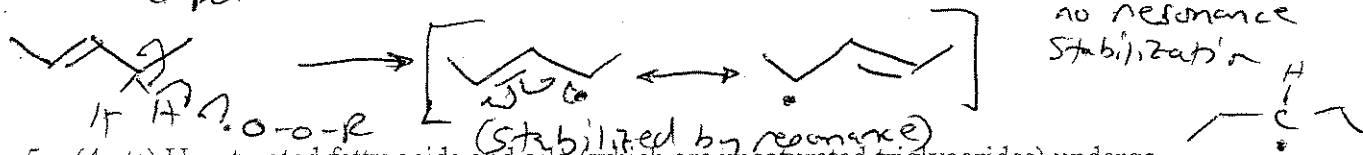
4. (4 pts) Briefly explain why the Gabriel Synthesis shown below is generally a better method (gives a higher yield of the desired product) to make methyl amine than the S_N2 reaction of an amine and alkyl halide.



In the S_N2 rxn of NH_3 w/ CH_3Br the pdt methylamine is more reactive than the ammonia starting material because the electron donating methyl group makes methylamine a stronger nucleophile than ammonia. Consequently, the pdt will react more readily with CH_3Br than NH_3 giving *relatively large amounts of* impurities of the 2° amine (some 3° amine can also be produced). In the Gabriel synthesis 2° + 3° amines can not be formed, hence a higher yield of the desired CH_3NH_2 will be produced.

unsat. compd

Sat. compd -
no resonance
Stabilization



5. (4 pts) Unsaturated fatty acids and oils (which are unsaturated triglycerides) undergo autooxidation much more readily than saturated fatty acids and fats (which are saturated triglycerides). Briefly explain why this is so. Any compd that can produce a stabilized free radical will undergo autooxidation more readily than those compds that can not produce a stabilized radical. Since compds that contain double bond can produce a stabilized allylic radical they will undergo autooxidation more readily than saturated compounds in which the allylic radical can not be stabilized by resonance (see above)

6. (8 pts) Give the **complete mechanism** for the formation of benzene diazonium chloride from aniline and the nitrosonium ion (the reactive intermediate which is produced from NaNO_2 and HCl).

