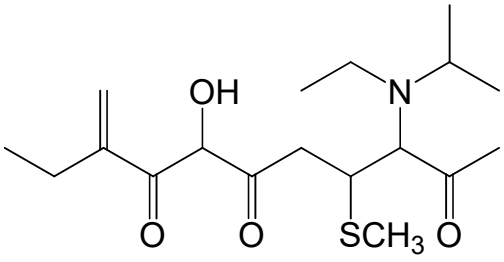
CHEM 266 – EXAM 3 (SPRING 2018) **NAME**_____

Wednesday April 25, 2018

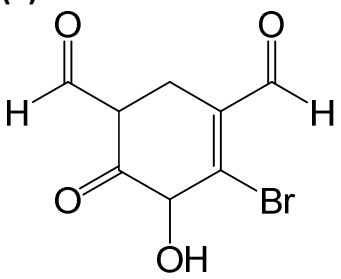
1. Name the following compounds (3 x 8 = 24 pts)

(a)



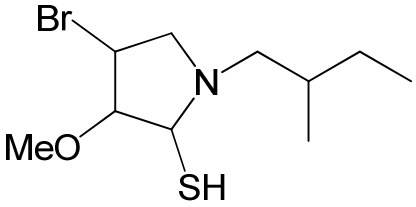
3-amino-9,N-diethyl-7-hydroxy-N-isopropyl -4-(methylthio) dec-9-ene-2,6,8-trione

(b)



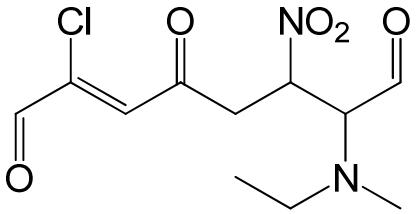
4-bromo-5-hydroxy-6-oxocyclohex-3-ene-1,3-dicarbaldehyde

(c)



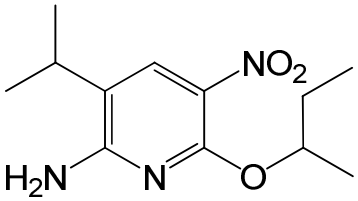
4-bromo-3-methoxy-1-(2-methylbutyl)pyrrolidine-2-thiol

(d)



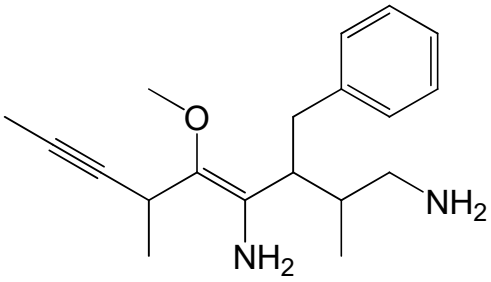
7-amino-2-chloro-*N*-ethyl-*N*-methyl-6-nitro-4-oxooct-2-enedial

(e)



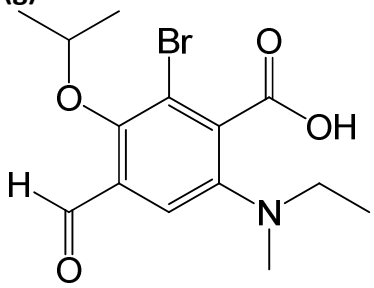
6-sec-butoxy-3-isopropyl-5-nitropyridin-2-amine

(f)



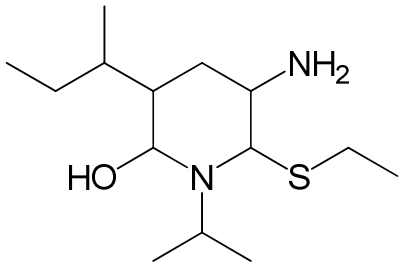
3-benzyl-5-methoxy-2,6-dimethylnon-4-en-7-yne-1,4-diamine

(g)



6-amino-2-bromo-*N*-ethyl-4-formyl-3-isopropoxy-*N*-methylbenzoic acid

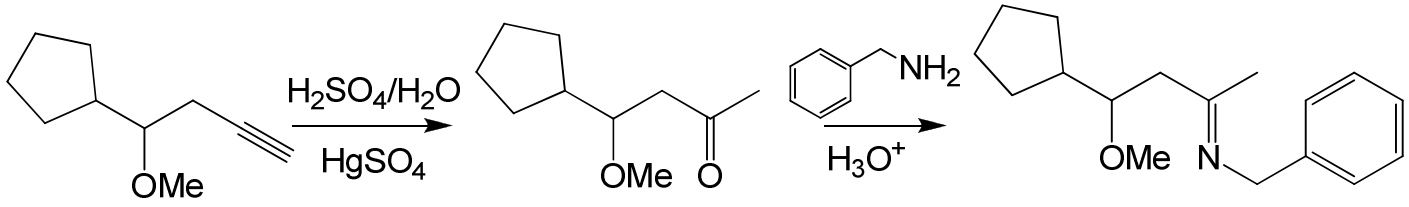
(h)



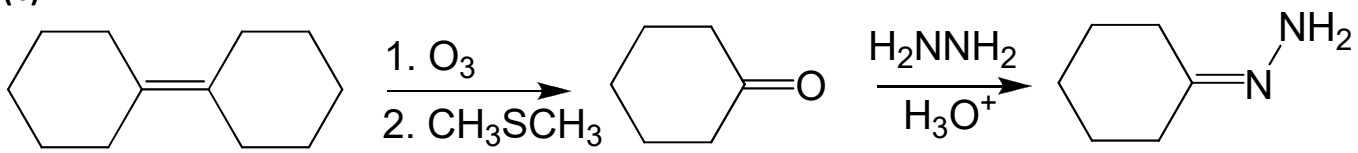
5-amino-3-sec-butyl-6-(ethylthio)-1-isopropylpiperidin-2-ol

2. Predict the major product(s) expected from the following reactions (3 x 16 = 48 pts)

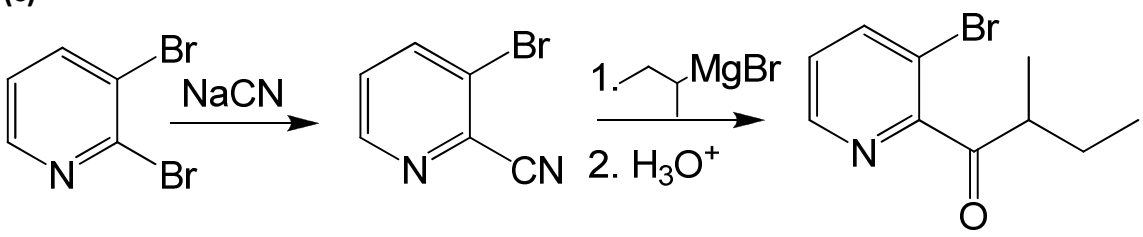
(a)



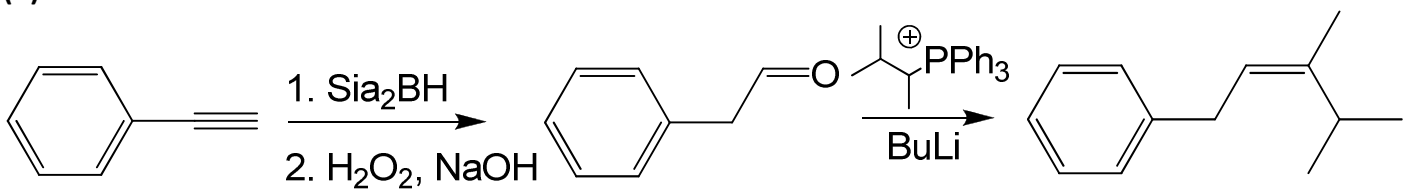
(b)



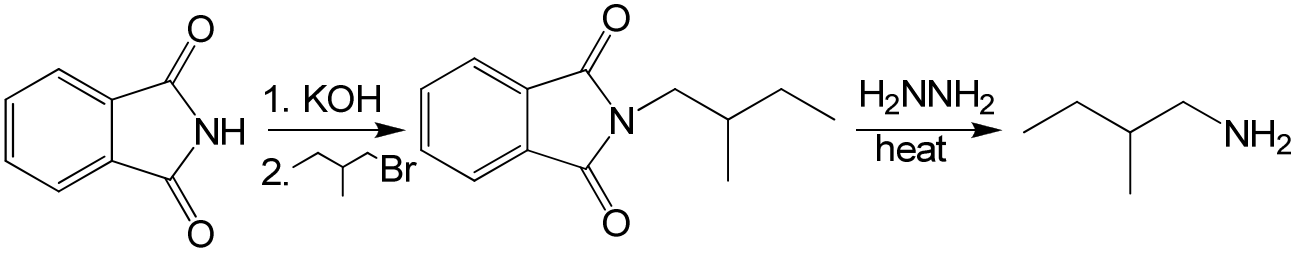
(c)



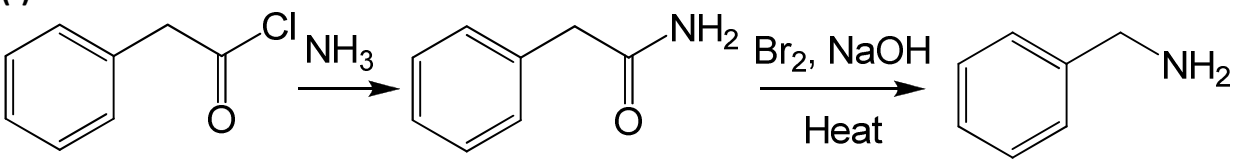
(d)



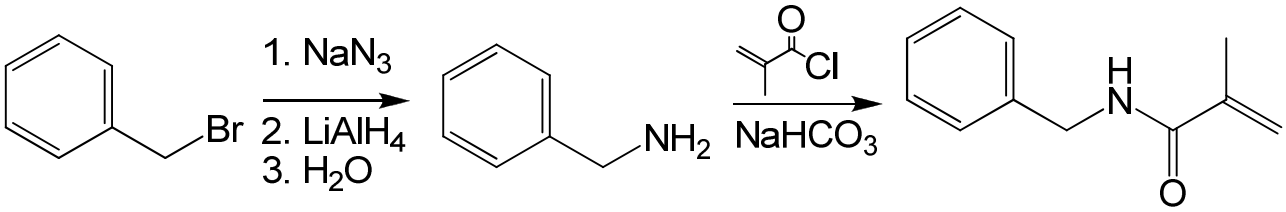
(e)


O
NH
O
1. KOH
2.
Br
O
N
O
H_2NNH_2
heat
NH_2

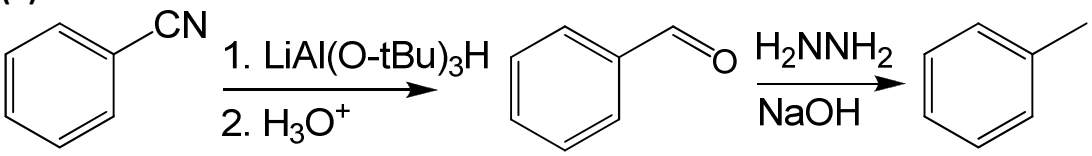
(f)


Cl
O
NH_3
NH_2
O
Br_2, NaOH
Heat
NH_2

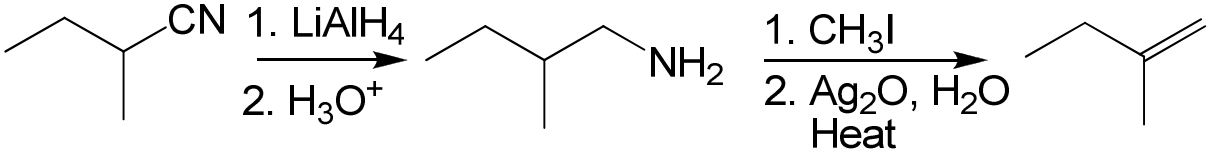
(g)


Br
1. NaN_3
2. $LiAlH_4$
3. H_2O
NH_2
O
Cl
$NaHCO_3$
H
N
O

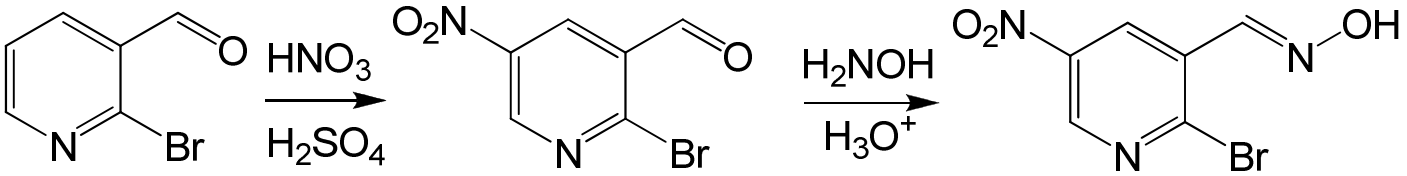
(h)


CN
1. $LiAl(O\text{-}tBu)_3H$
2. H_3O^+
O
H_2NNH_2
NaOH

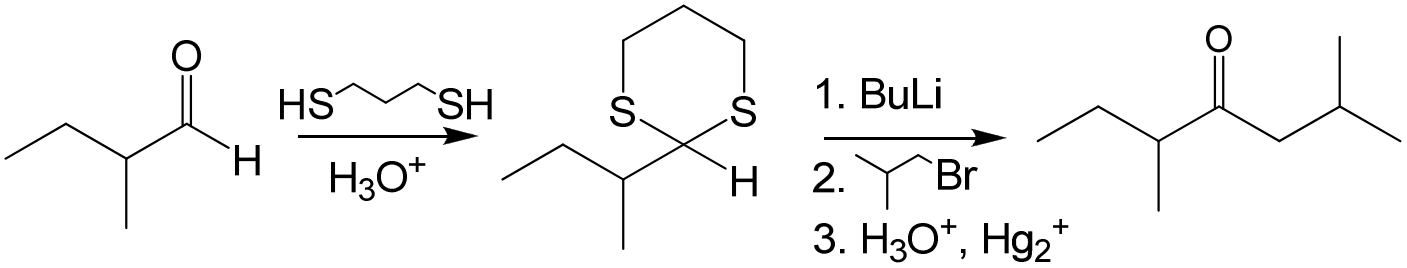
(i)


CN
1. $LiAlH_4$
2. H_3O^+
NH_2
1. CH_3I
2. Ag_2O, H_2O
Heat

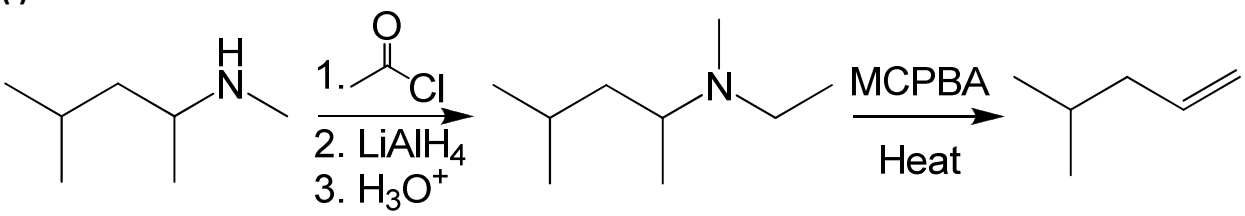
(j)


O
N
Br
HNO_3
H_2SO_4
O_2N
O
N
Br
H_2NOH
H_3O^+
O_2N
N
OH
N
Br

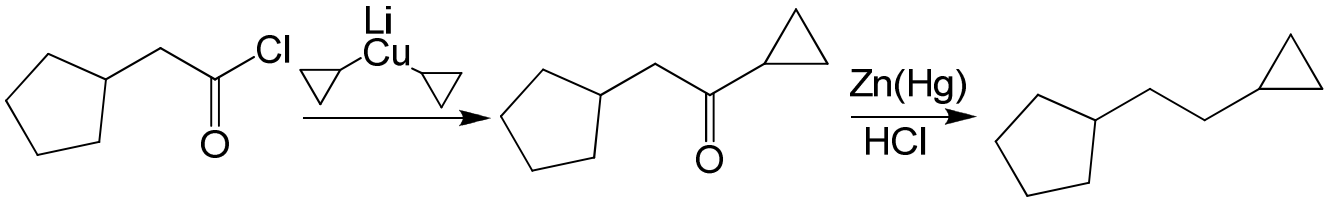
(k)


O
H
HS
SH
H_3O^+
S
S
H
1. BuLi
2.
Br
3. H_3O^+, Hg_2^+
O

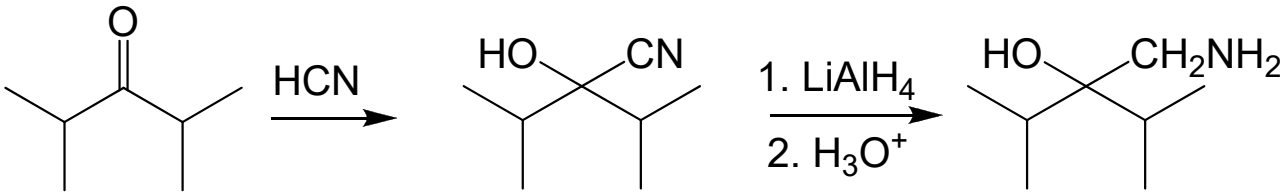
(l)



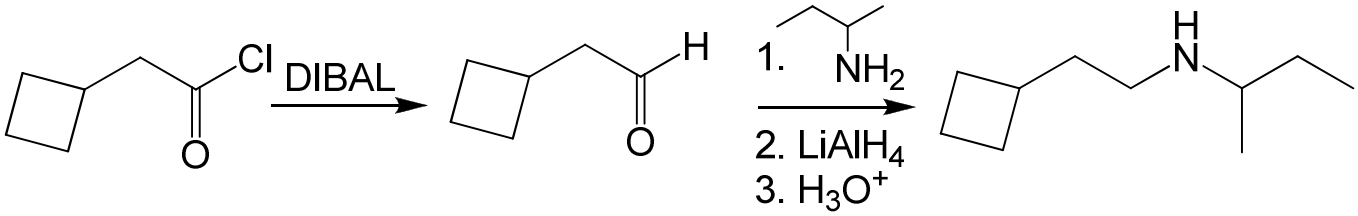
(m)



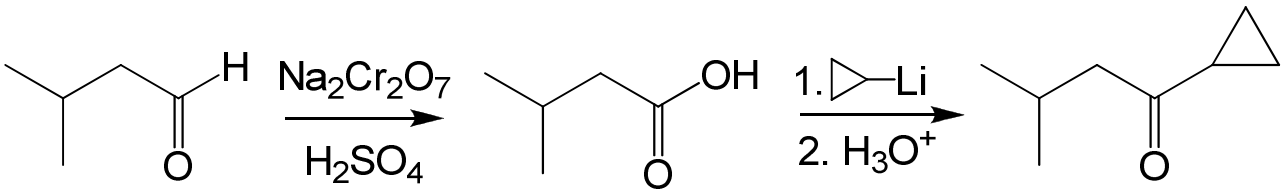
(n)



(p)

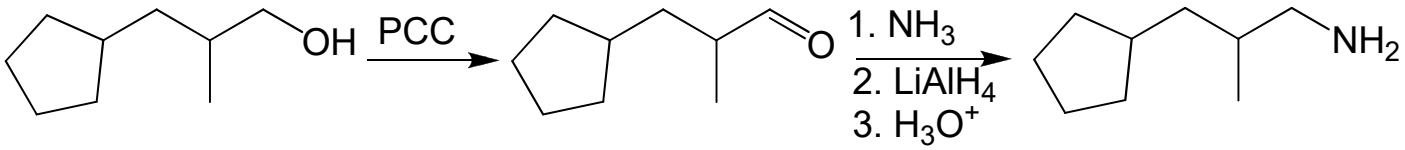


(q)

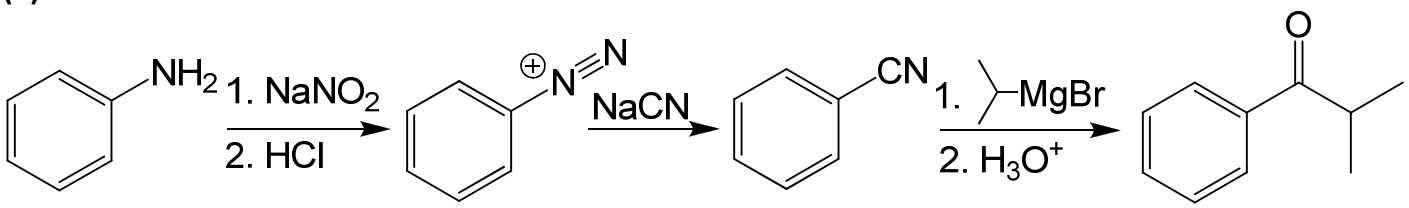


3. Show how you would synthesize each of the following compounds from the given starting material(s). You **must** show all the intermediates to receive full credit (3 x 6 = 18 pts)

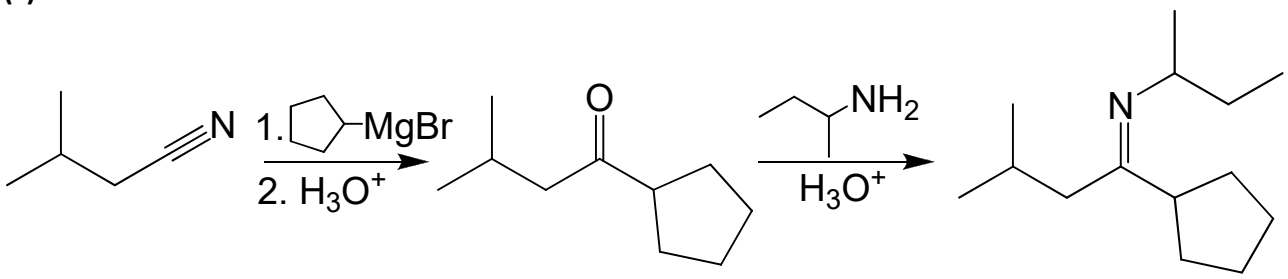
(a)



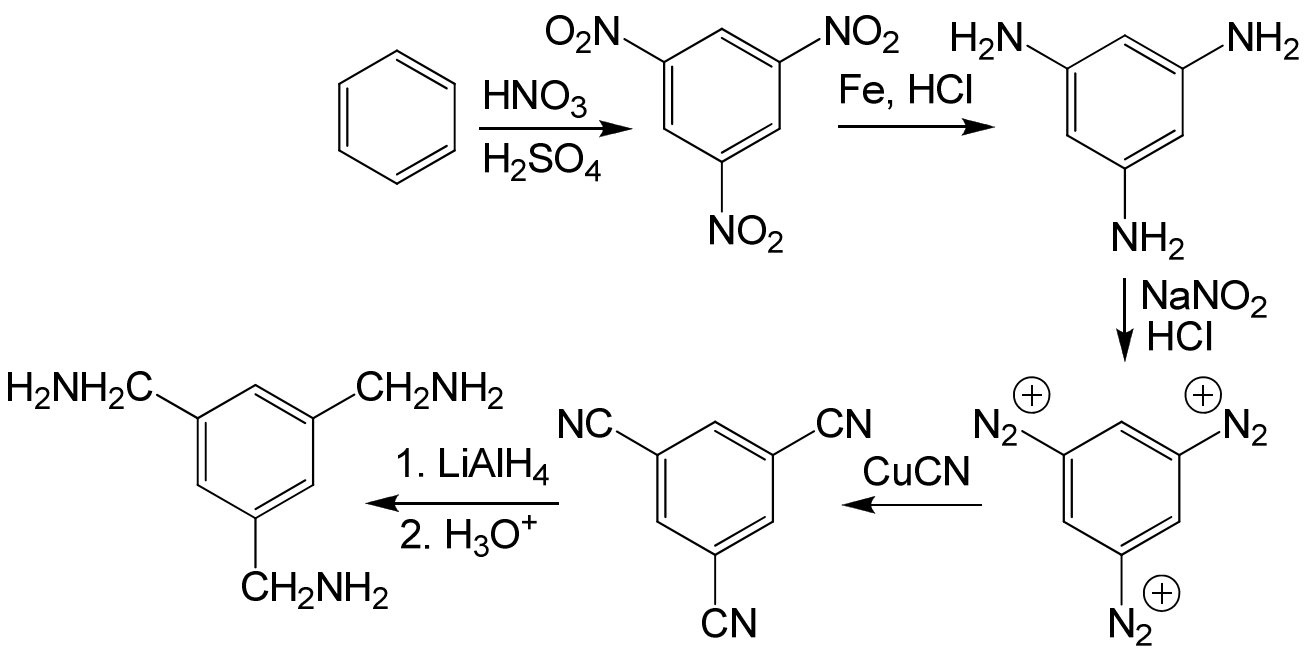
(b)


NH2
1. NaNO2
2. HCl
N
NaCN
CN
1.
MgBr
2. H3O+
O

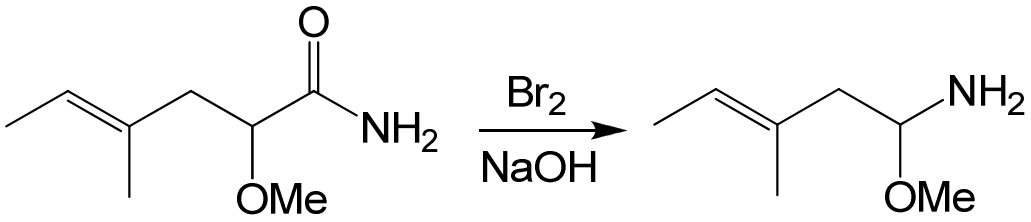
(c)


N
1.
MgBr
2. H3O+
O
NH2
H3O+
N

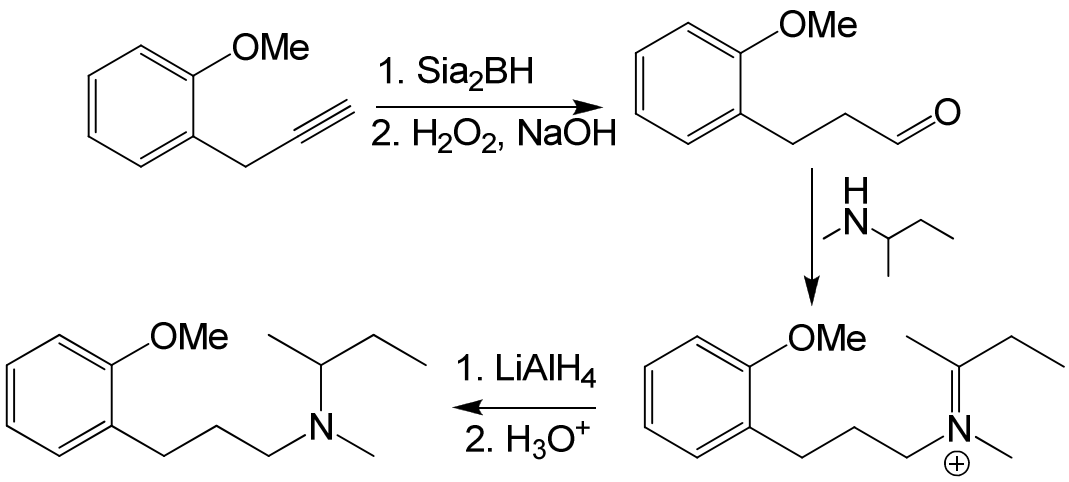
(d)


O2N
NO2
HNO3
H2SO4
NO2
H2N
NH2
Fe, HCl
NH2
NaNO2
HCl
N2
N2
N2
CuCN
NC
CN
CN
1. LiAlH4
2. H3O+
H2NH2C
CH2NH2
CH2NH2

(e)

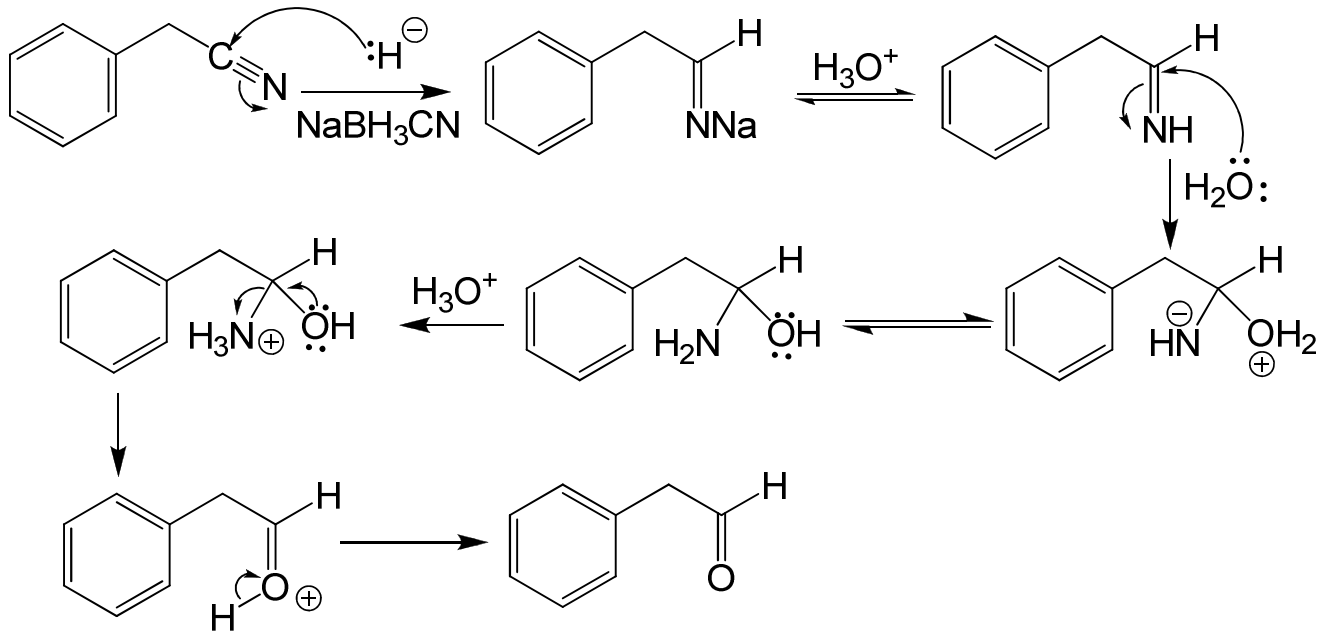

O
NH2
OMe
Br2
NaOH
NH2
OMe

(f)

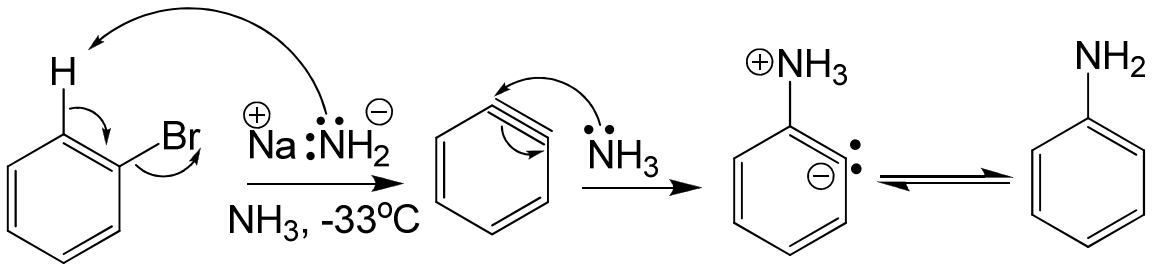


4. Propose a mechanism consistent with the following reactions (you must show all the intermediates to receive full credit) (3.5 x 3 = 10.5 pts)

(a)



(b)



(c)