

Application

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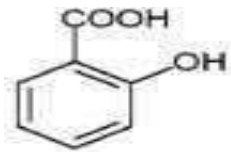
Discussion

Dr. kanan Mahmoud Al-Wuhaidi

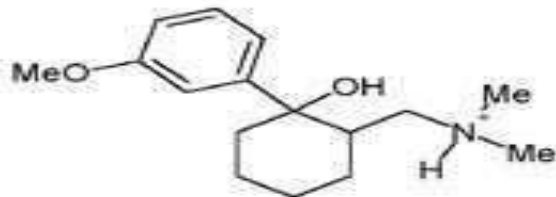
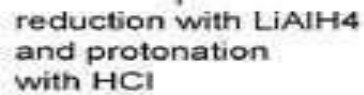
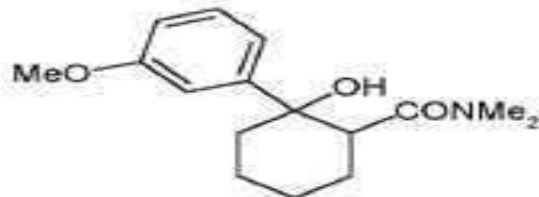
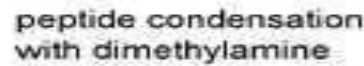
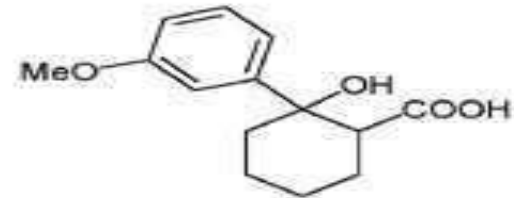
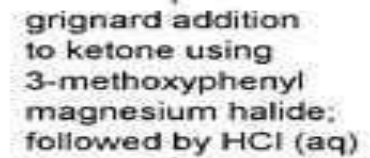
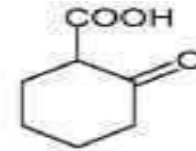
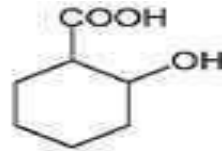
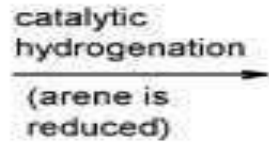
Part 1

“Drug Synthesis”

1- Tramadol

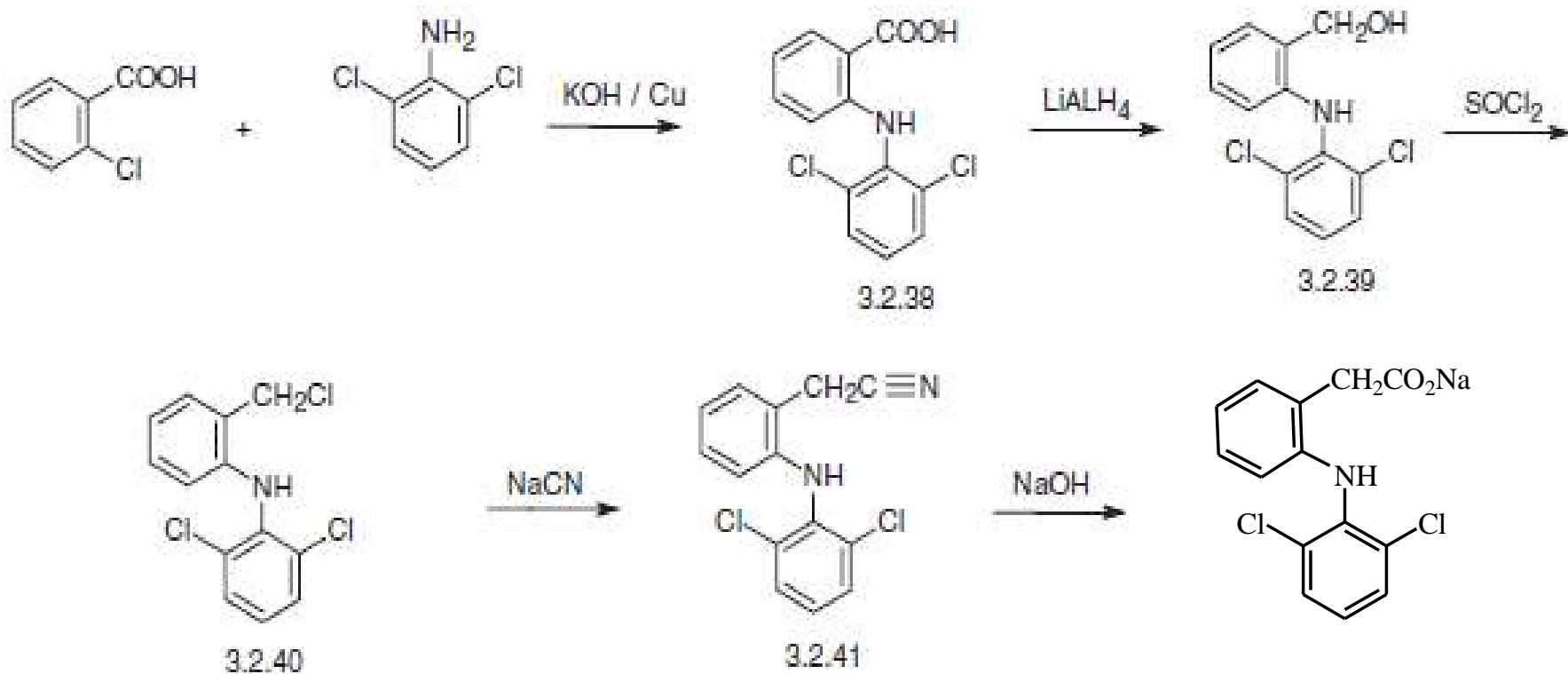


salicylic acid

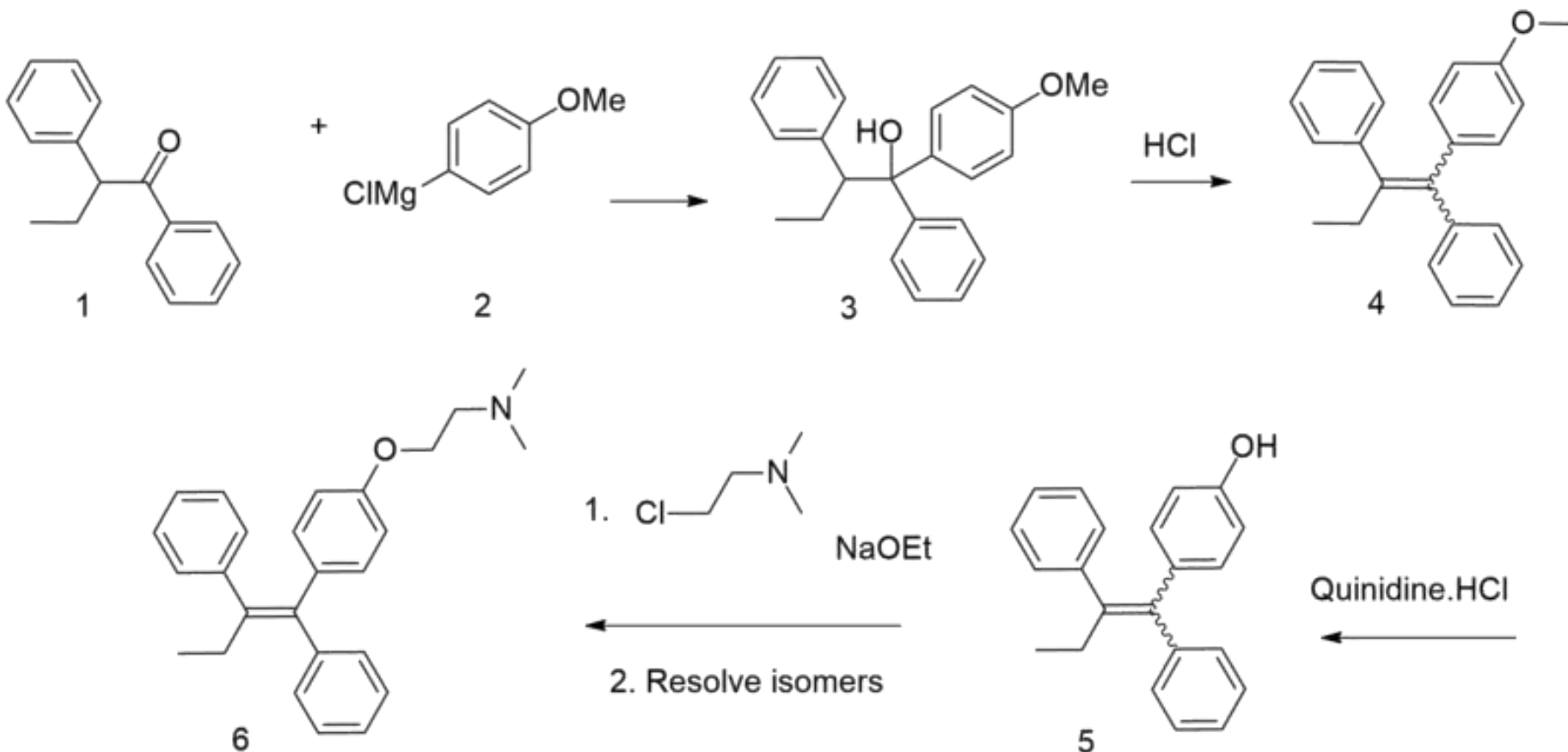


tramadol hydrochloride salt

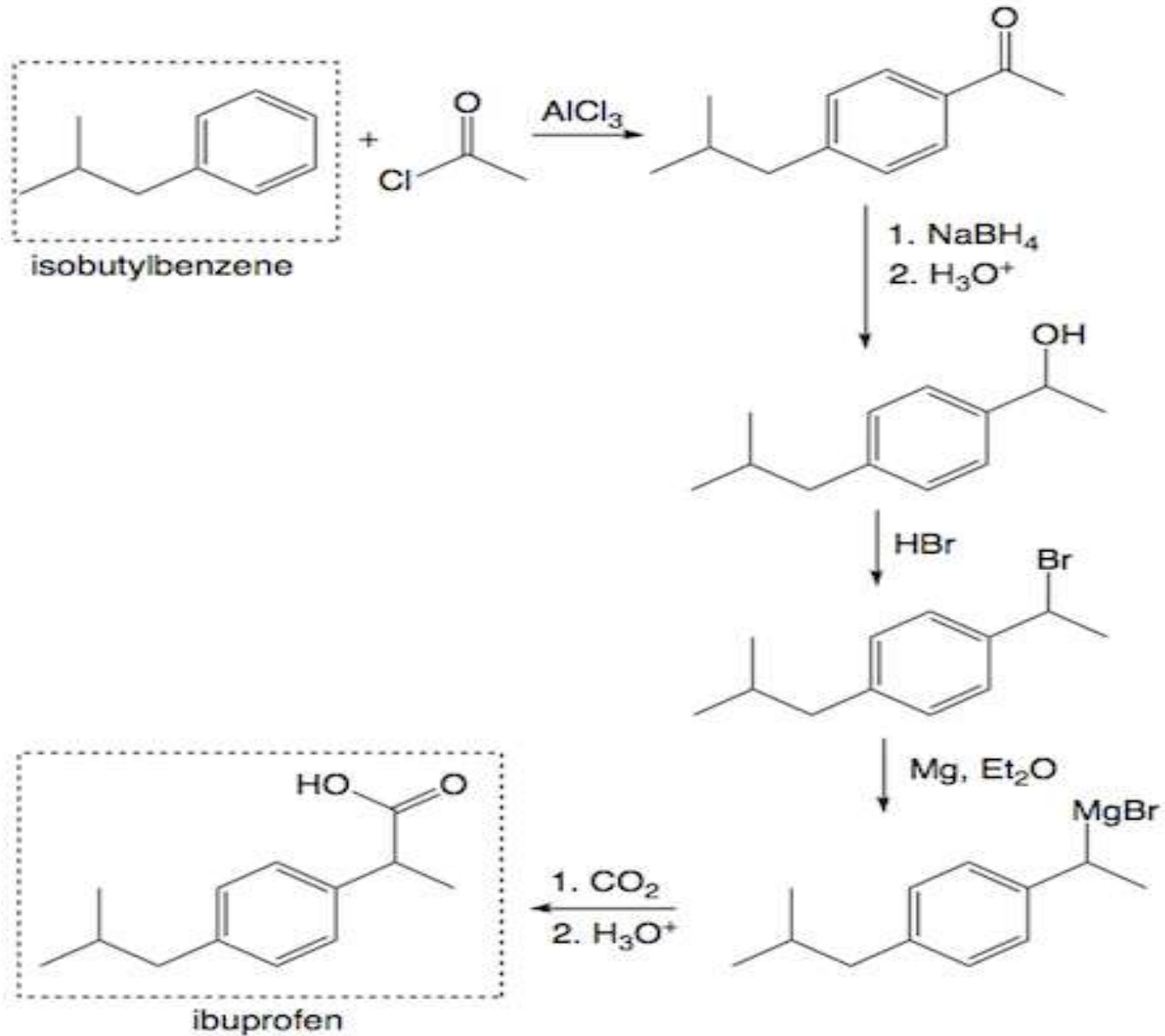
2- Diclofenac Sodium



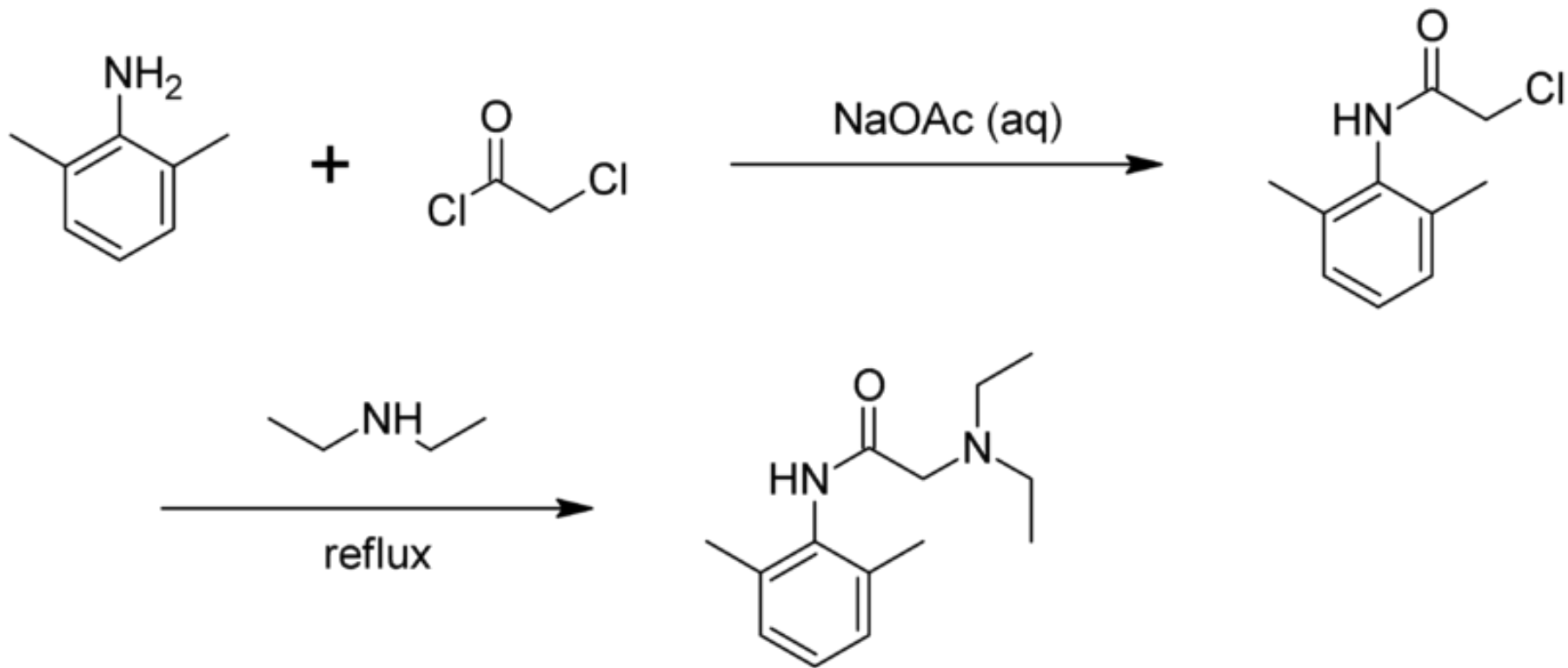
3- Tamoxifen



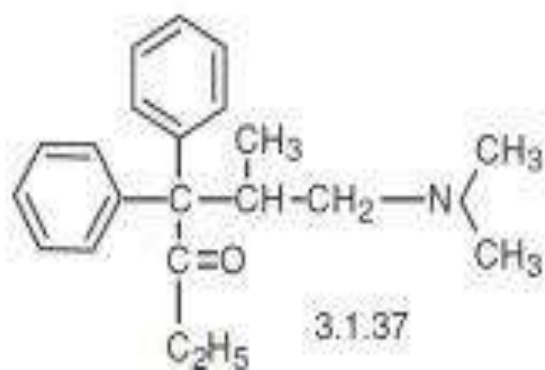
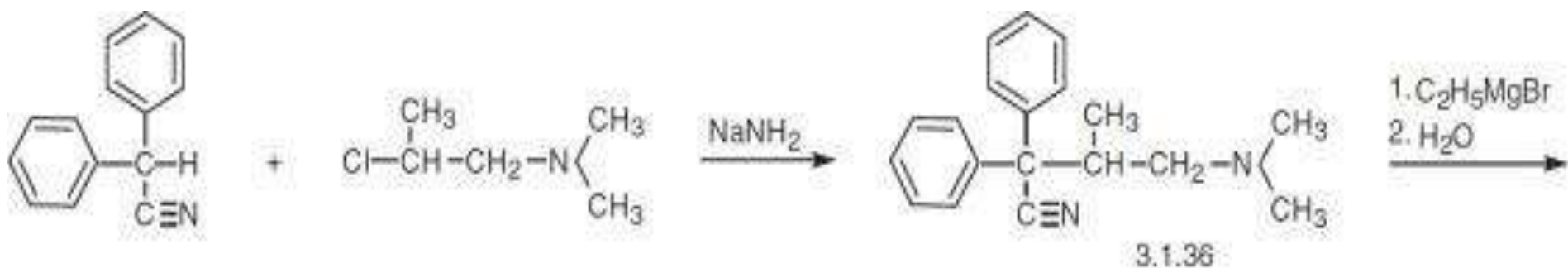
4- Ibuprofen



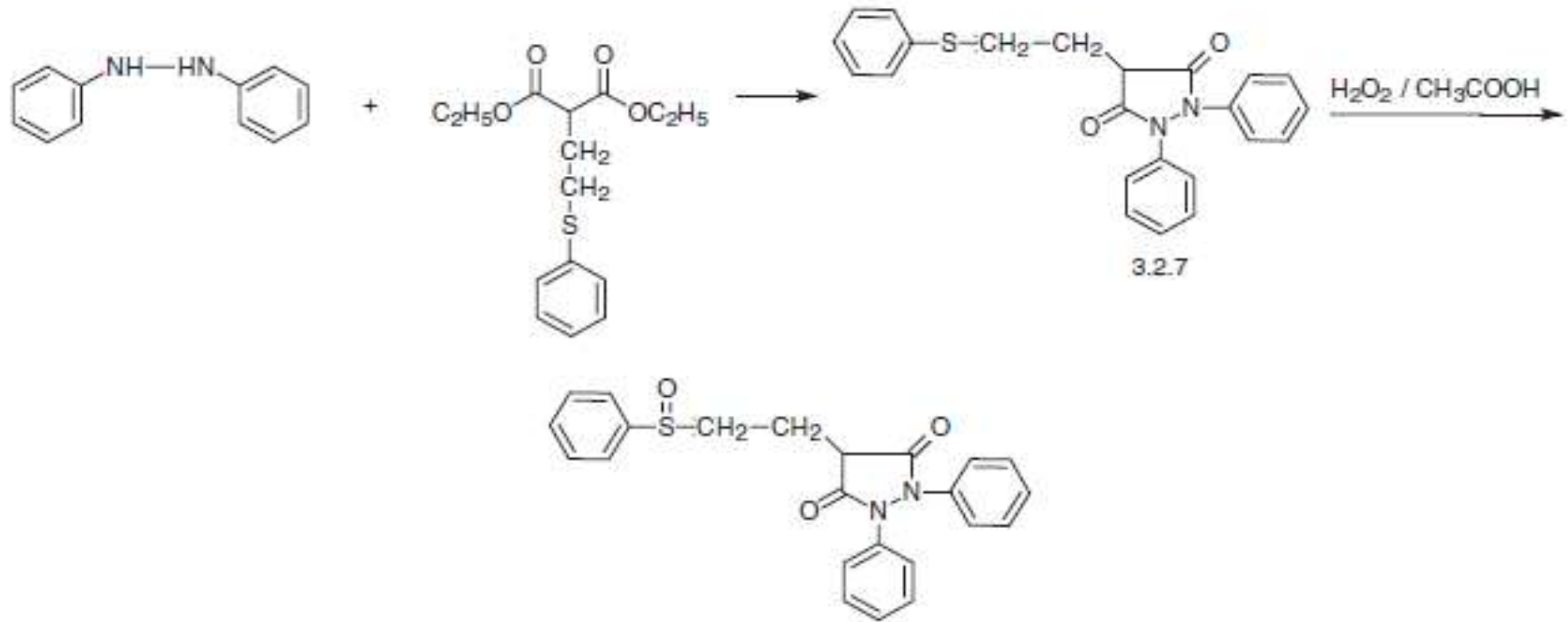
5- Lidocaine



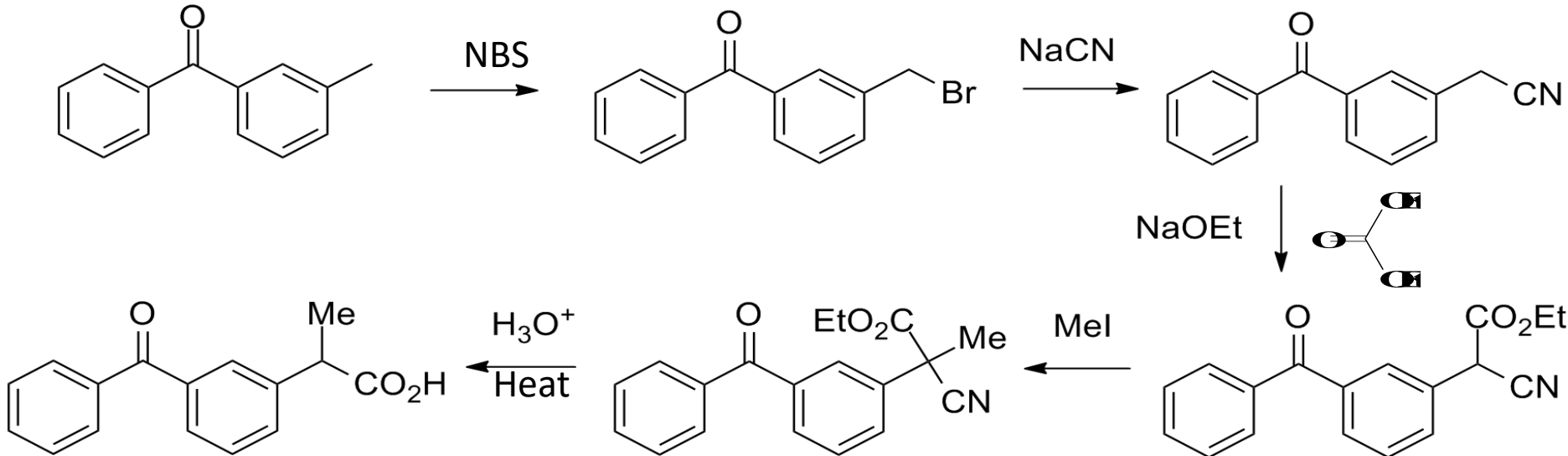
6- Methadone



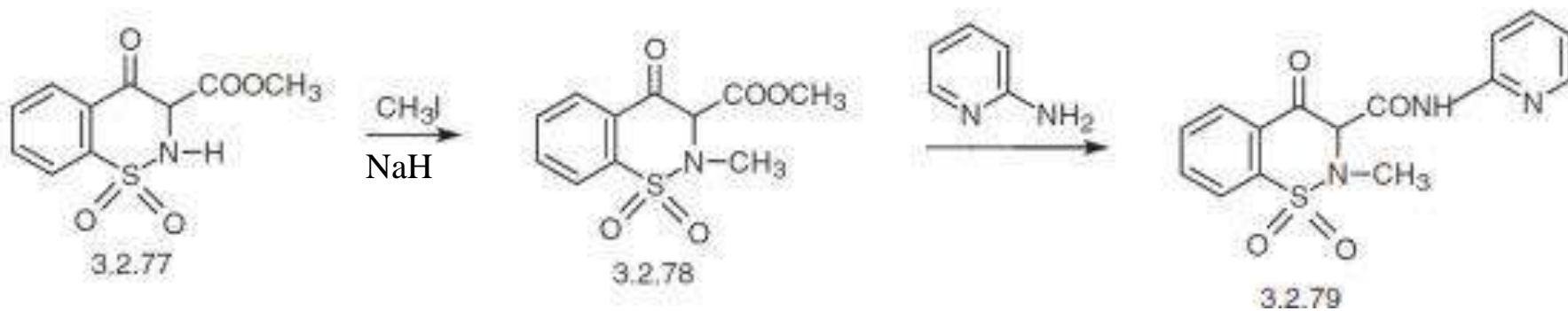
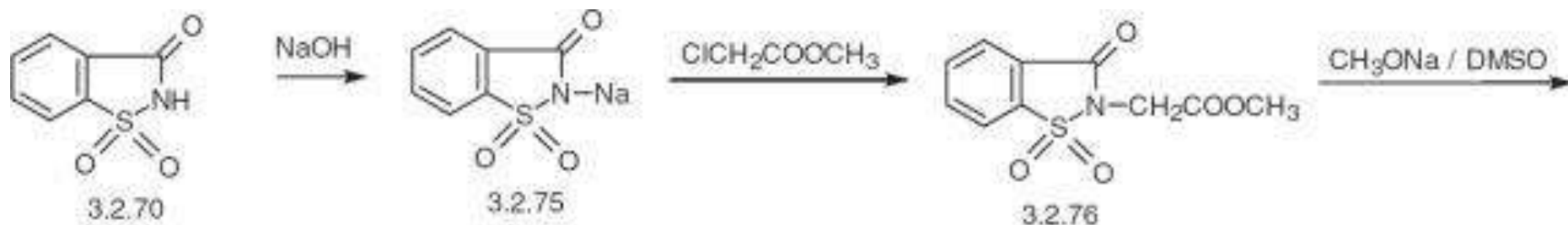
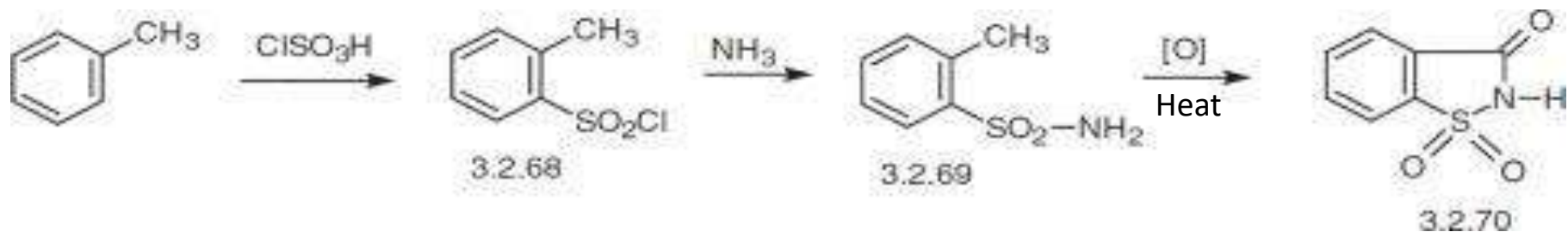
7- Sulfinpyrazone



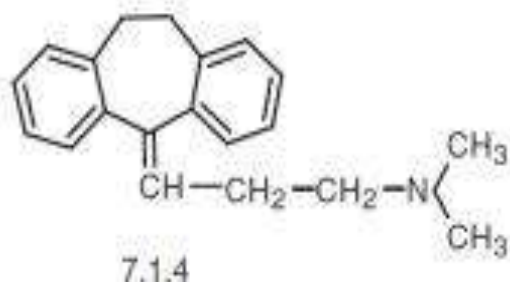
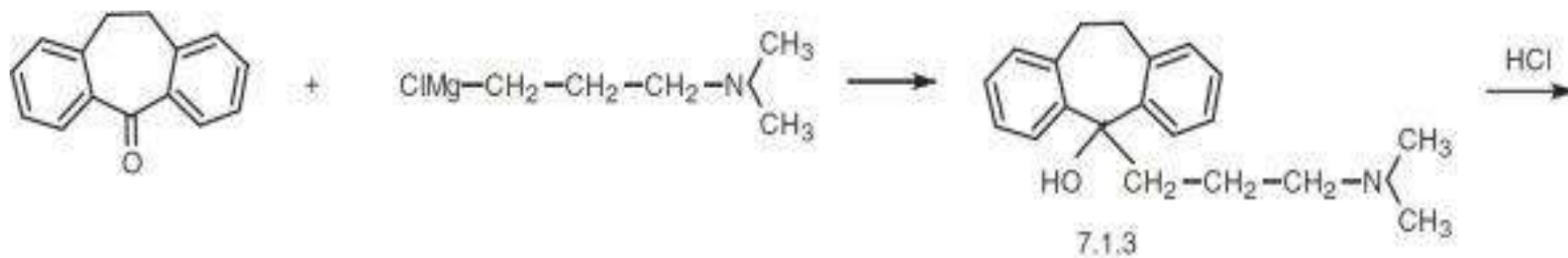
8- Ketoprofen



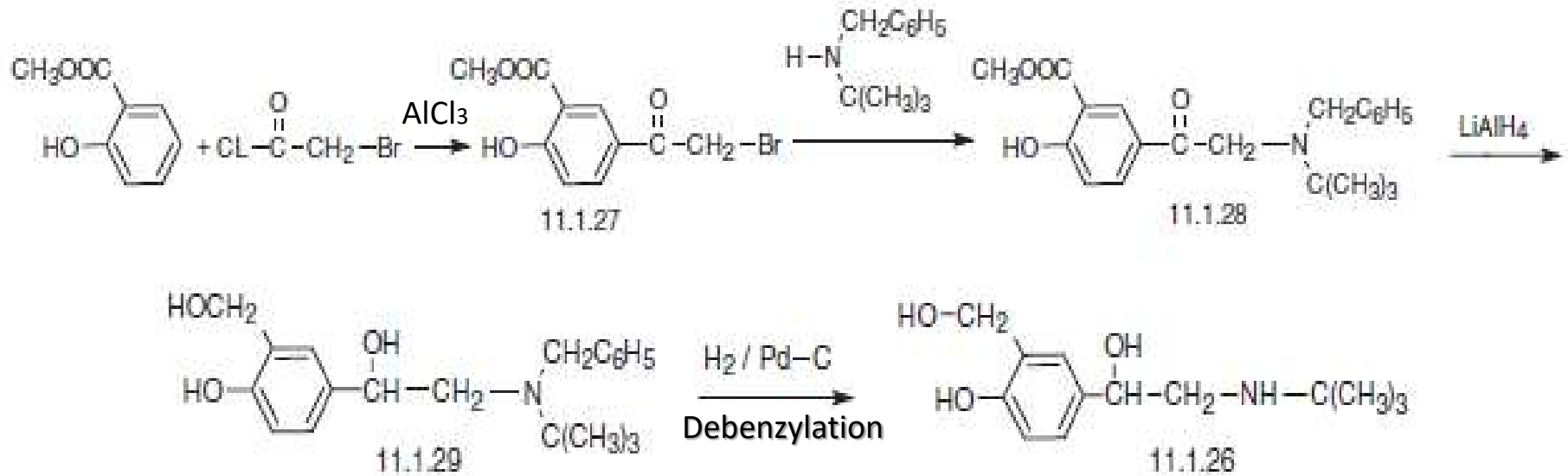
9- Piroxicam



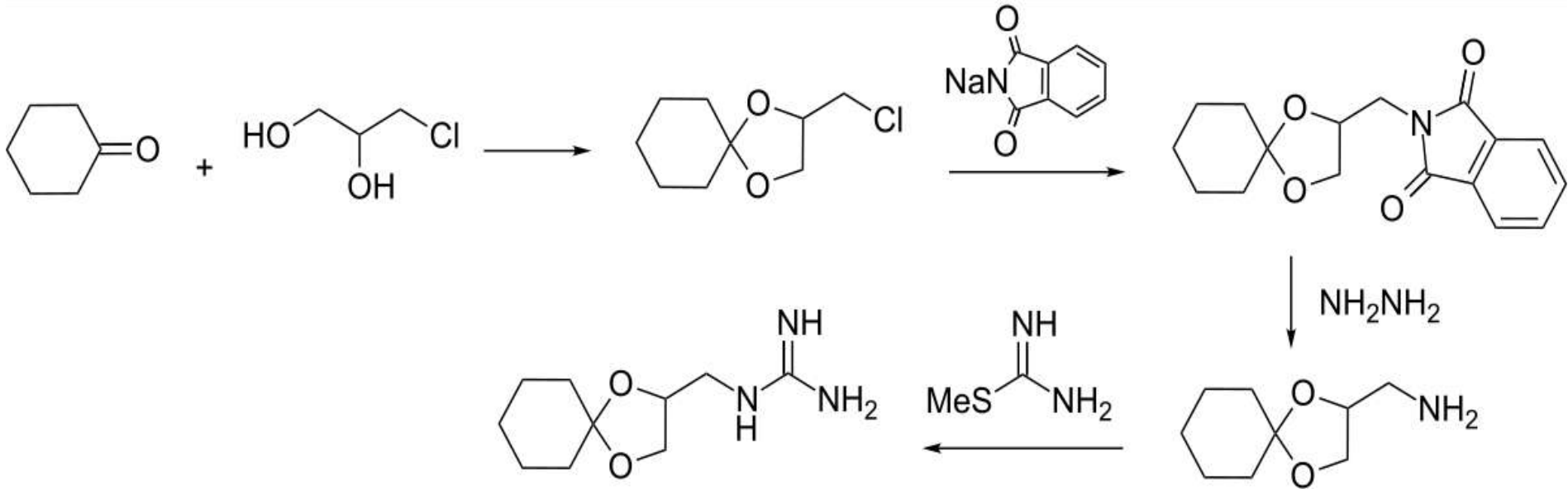
10- Amitriptyline



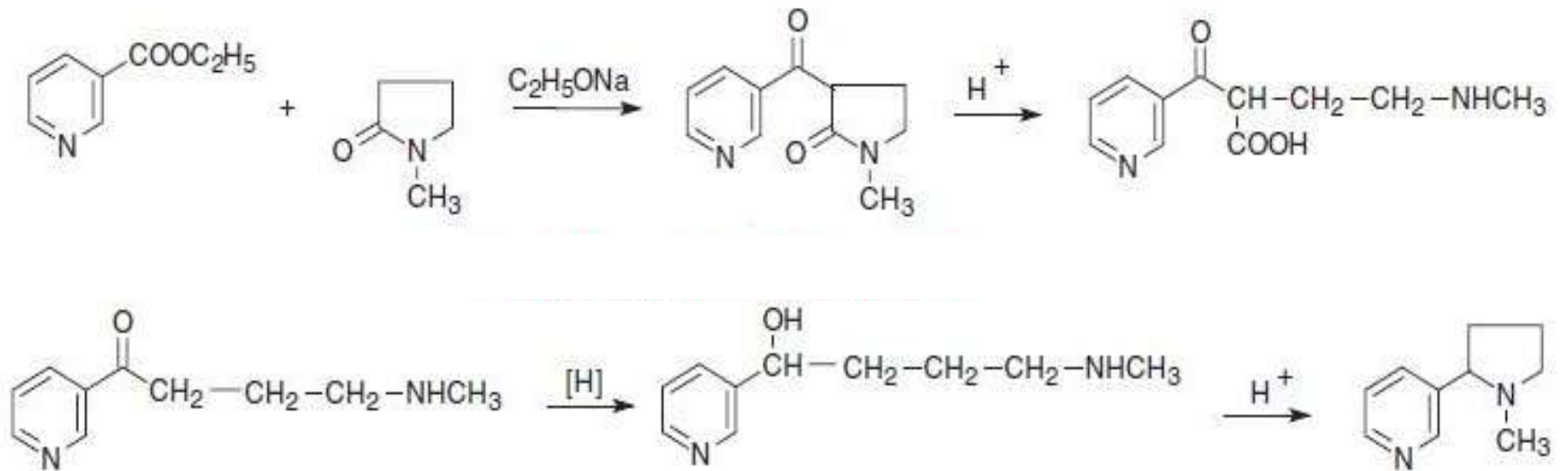
11- Albutreol



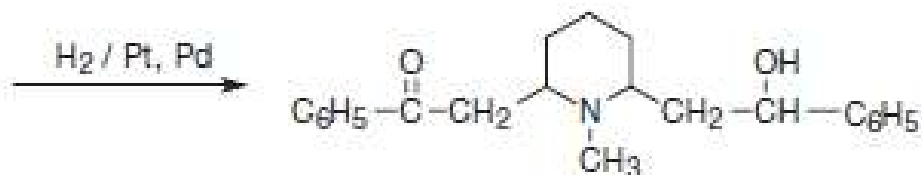
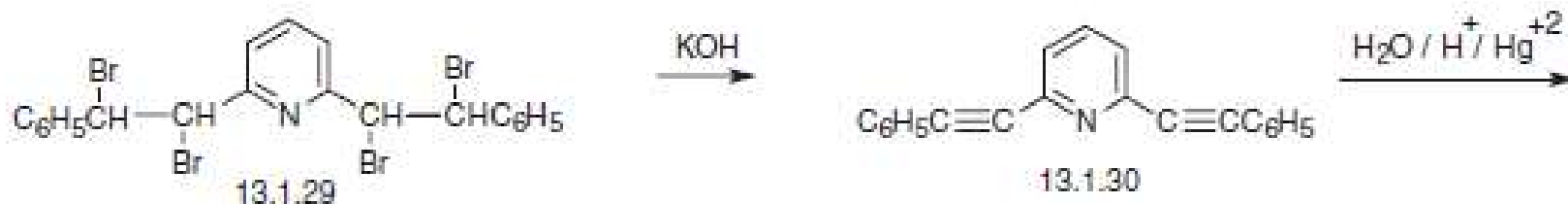
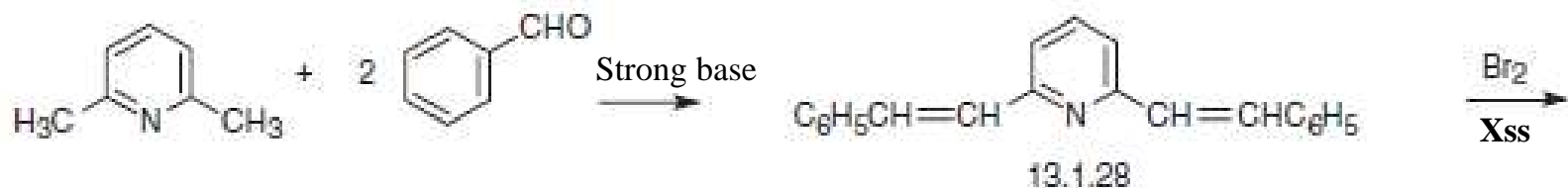
12- Guanadrel



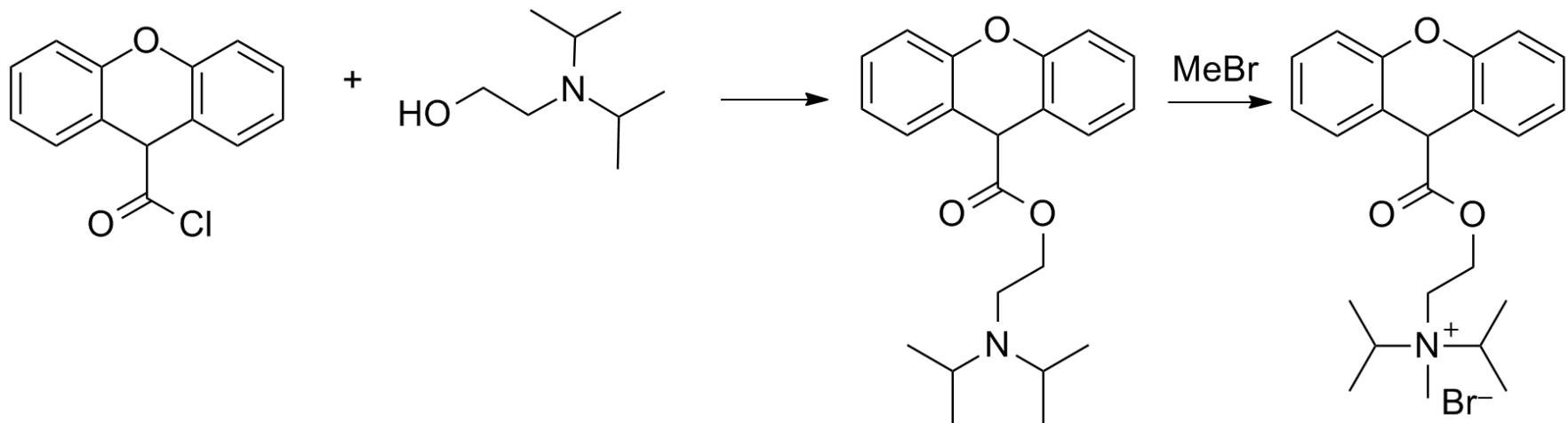
13- Nicotine



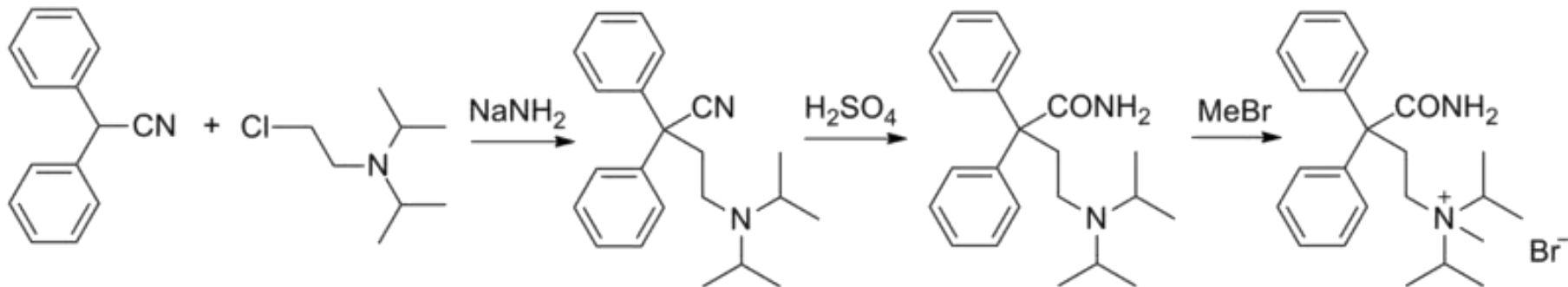
14- lobeline



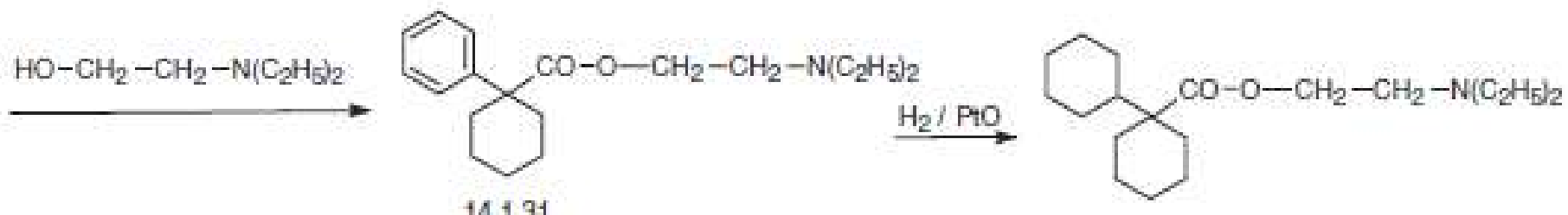
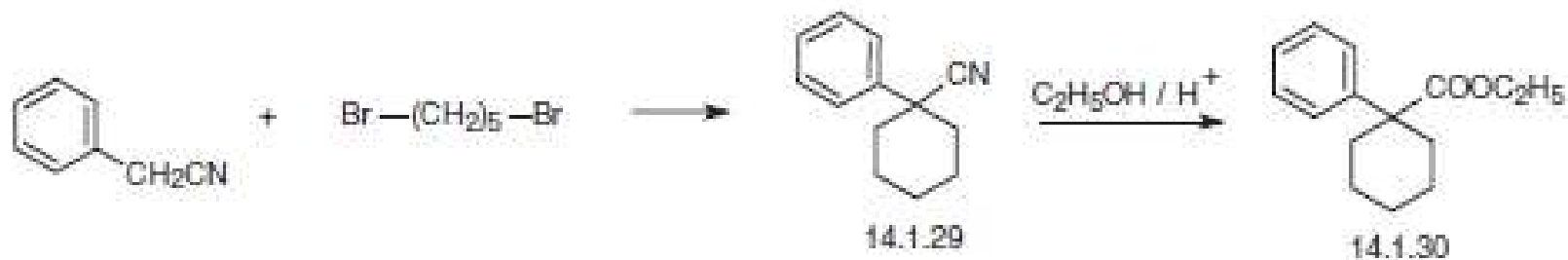
15- Propantheline



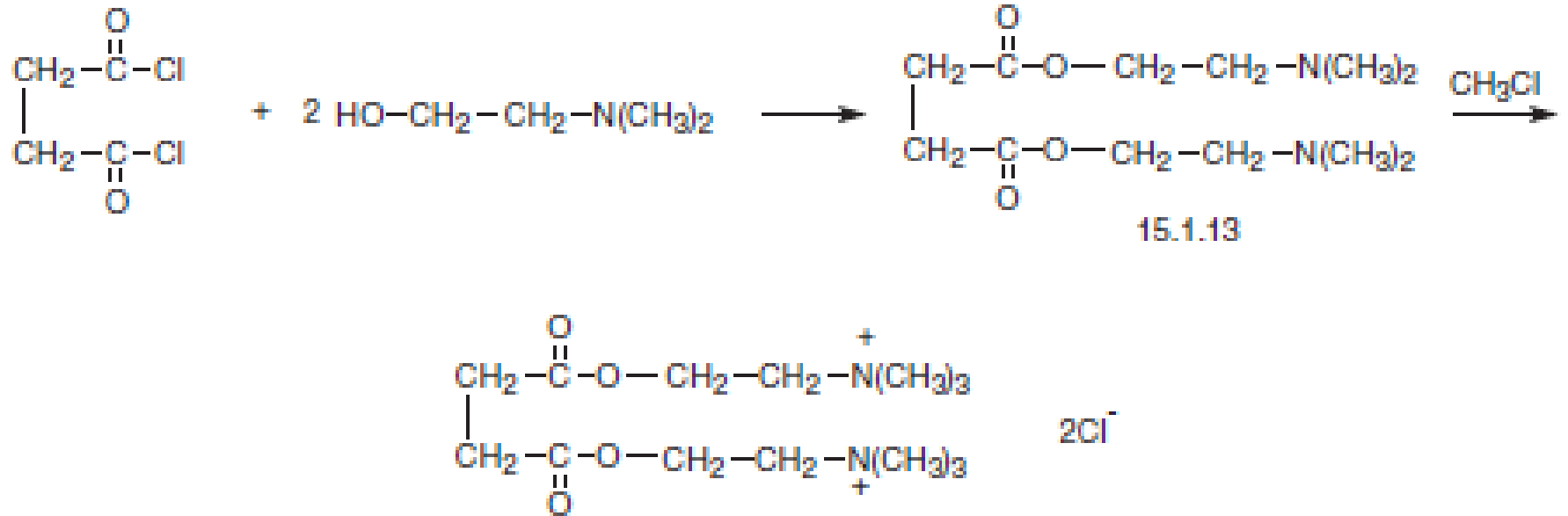
16- Isopropamide



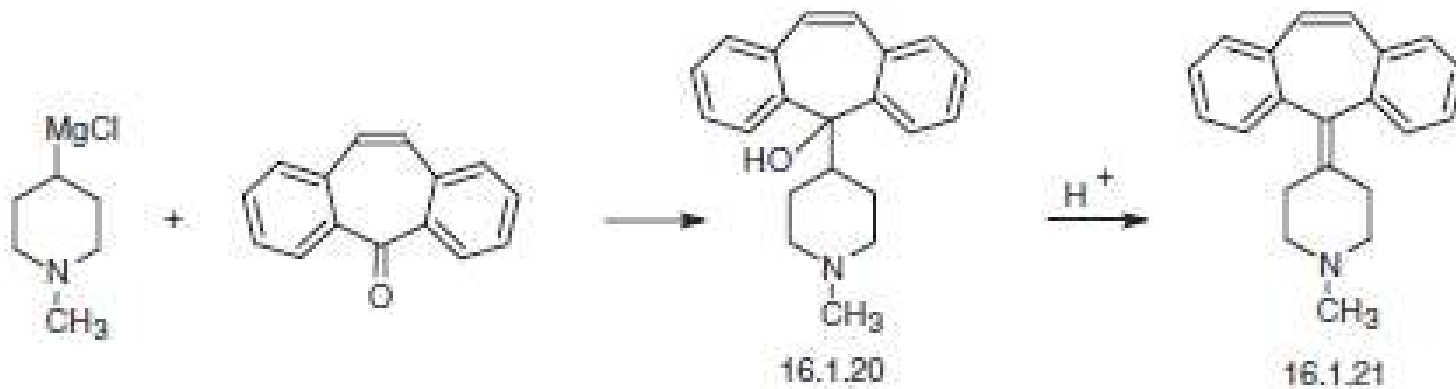
17- Dicyclomine



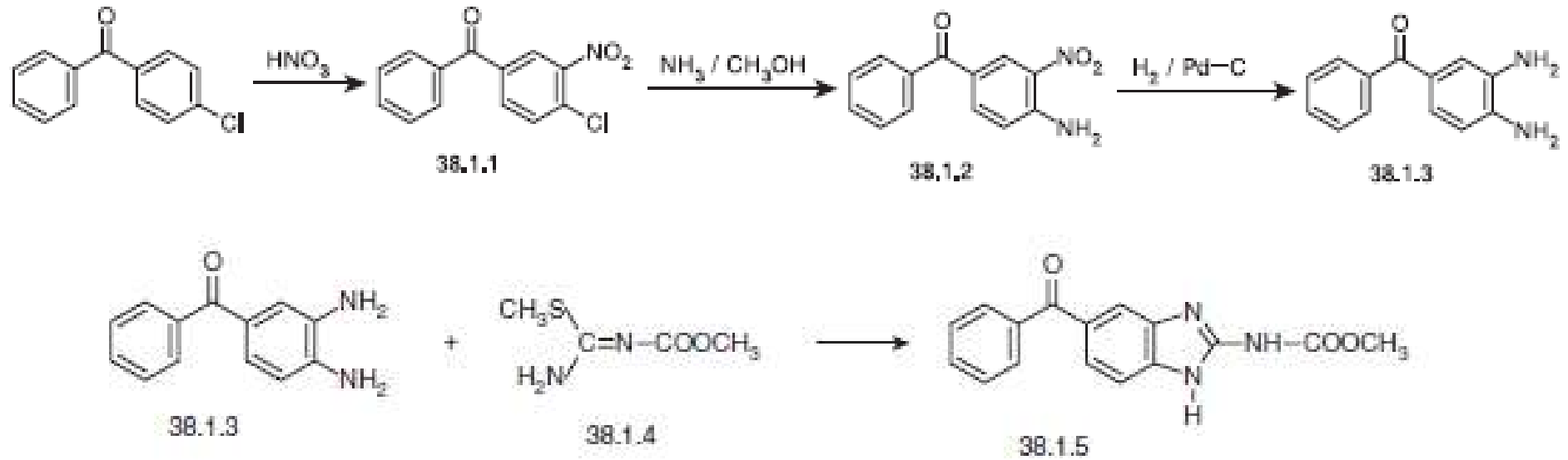
18- Succinylcholine



19- Cyproheptadine

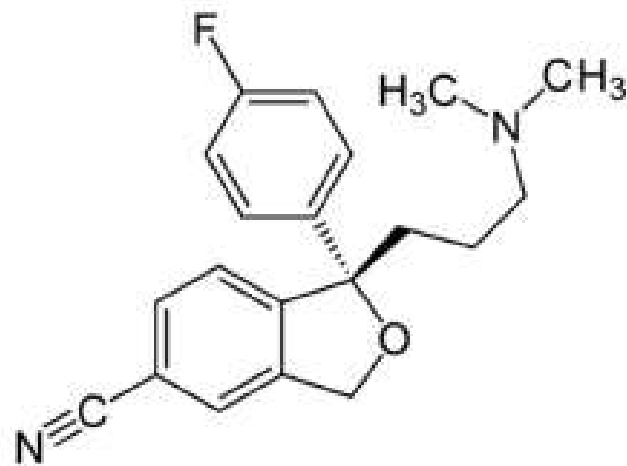


20- mebendazole



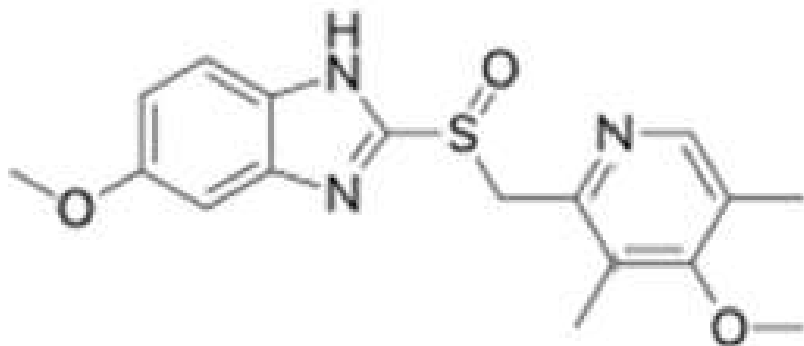
Part 2

“Discussion”



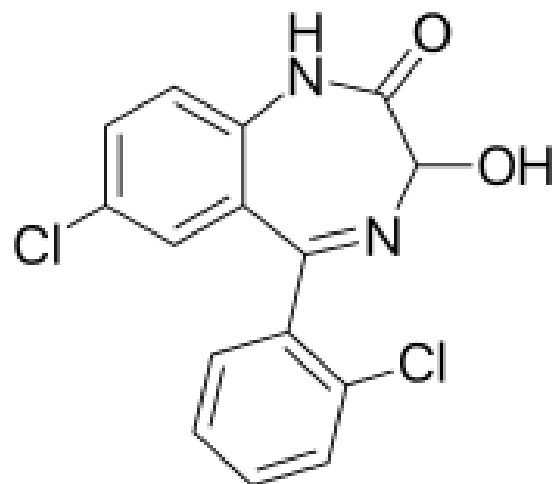
1] Lexapro (Antidepressant)

- What is the effect of treating the drug with acetic acid at room temperature?
- What will happen if the drug is heated with NaOH or HCl?
- What will happen if the drug is treated with CH₃I(XSS) and Ag₂O?
- What will happen if the drug is treated with DIBAL?
- What will happen if the drug is treated with KMnO₄ ?



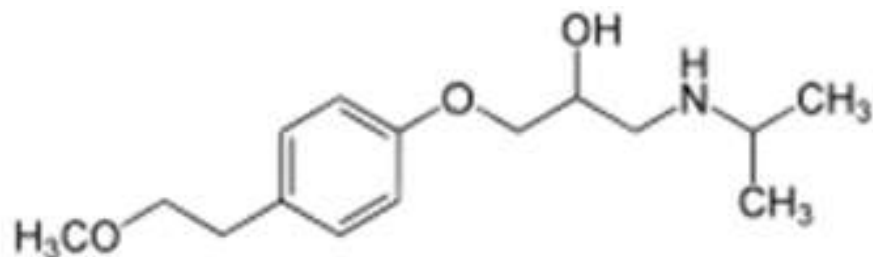
2] Omeprazole (Proton pump inhibitors (PPIs))

- Name the heterocyclic rings in the drug?
- What will happen if the drug is heated with NaH then with CH₃I?
- What will happen if the drug is treated with acetic acid?
- What will happen if the drug is treated with KMnO₄/NaOH ?



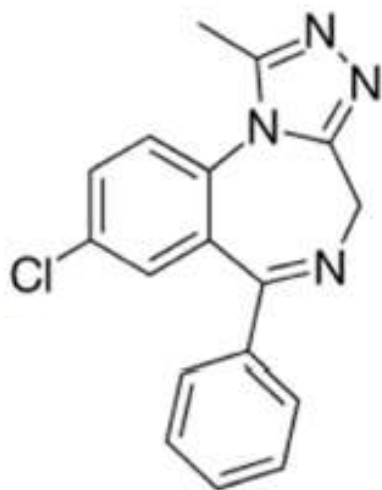
3] Lorazepam (psychoactive drug)

- What are the nitrogen functionalities?
- What will happen if the drug is heated with aqueous HCl?
- What will happen if the drug is treated with LiAlH_4 ?
- What will happen if the drug is treated with PCC?
- What will happen if the drug is treated with Mg/Dry ether and then with CO_2 ?



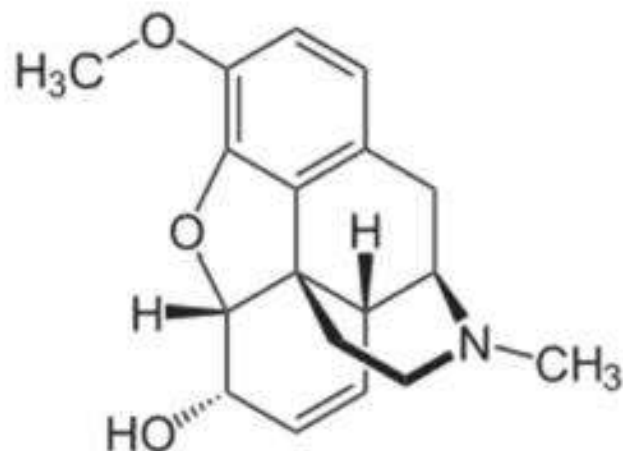
4] Metoprolol (treat HTN)

- What is the effect of treating the drug with phosgene?
- What will happen if the drug is treated with HCl?
- What will happen if the drug is treated with KMnO₄ (NaOH)?
- What will happen if the drug is Nitrated using (nitric acid+ sulfuric acid)?



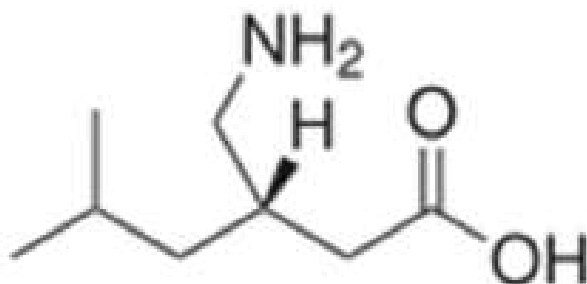
5] Alprazolam (anticonvulsant)

- Is the 5 membered ring aromatic?
- Which is the least basic nitrogen?
- Does the drug contain imine functionality?
- What will happen if the drug is treated Mg(dry ether) then with carbon dioxide?
- What will happen if the drug is treated with $\text{KMnO}_4/\text{NaOH}$?



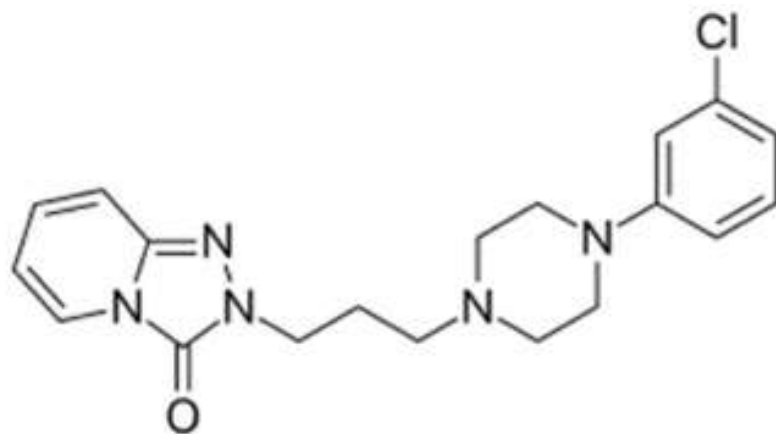
6] Codeine (sedative)

- What is the effect of treating the drug with methyl chloride?
- What will happen if the drug is heated with NaH then followed by benzoyl chloride?
- What will happen if the drug is heated with HCl?
- What will happen if the drug is treated with O_3/Zn ?



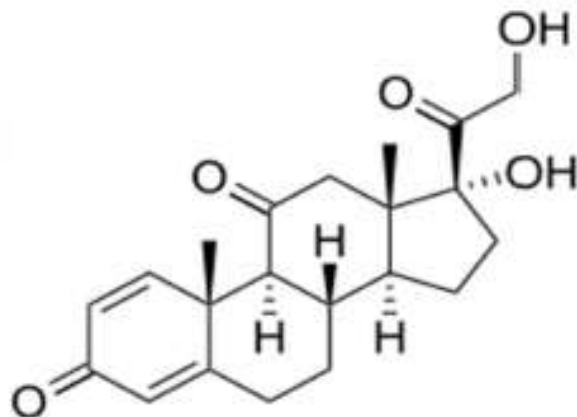
7] *Pregabalin (treat neuropathic pain and epilepsy)*

- What is the structure of Zwitterion of the drug?
- What will happen if the drug is treated with NaOH?
- What will happen if the drug is treated with DCC?
- What will happen if the drug is treated with benzaldehyde?
- What will happen if the drug is treated with acetyl chloride?



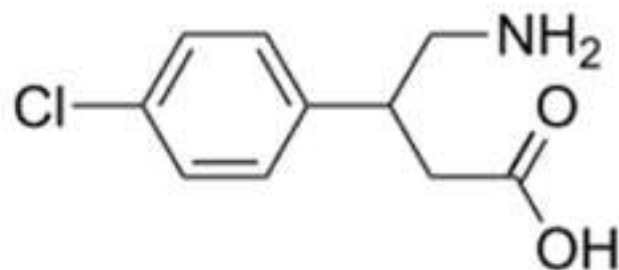
8] Trazodone (antidepressant)

- What is the name of hetero six-membered ring?
- What will happen if the drug is treated Mg then formaldehyde?
- What will happen if the drug is treated with HBr?
- Is it easy to replace Cl using any nucleophile?



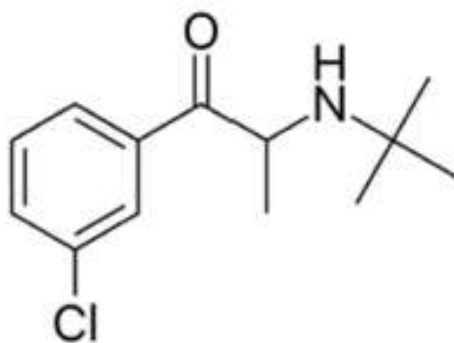
9] *Prednisone (Corticosteroid acts as immunosuppressant drug)*

- What will happen if the drug is treated with 3 moles of ammonia?
- What will happen if the drug is treated with PCC then an excess amount of NaBH_4 ?
- What will happen if the drug is treated with acetyl chloride?
- What will happen if the drug is treated with KMnO_4 followed by heat?



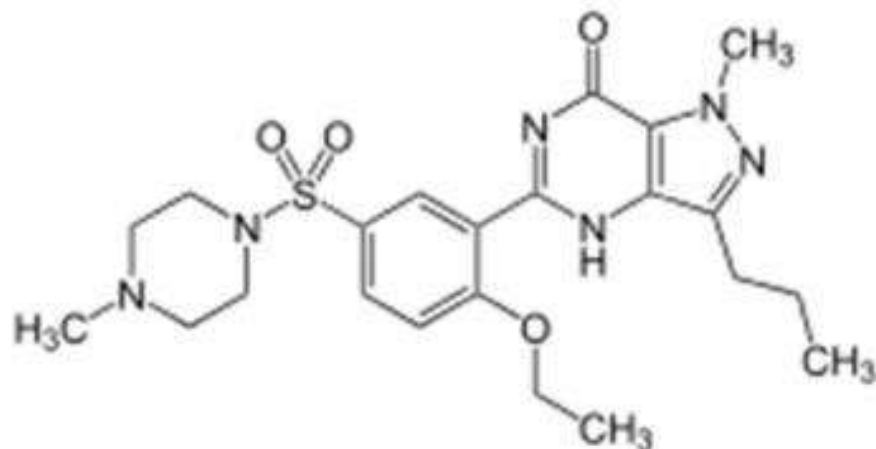
10] Baclofen (skeletal muscle relaxant)

- Draw the Zwitterion of the drug?
- What will happen if the drug is treated with NaOH? (at room temperature)
- What will happen if the drug is treated with thionyl chloride then heated?
- Lactam can be prepared in this compound? Explain



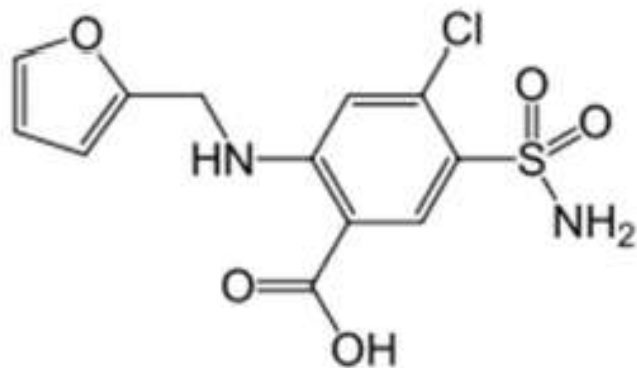
11] Bupropion (antidepressant)

- What will happen if the drug is treated with LiAlH_4 followed by heating with thionyl chloride?
- What will happen if the drug is treated with an excess amount of methyl iodide then silver oxide and then with water?
- What will happen if the drug is treated with acetone in acidic media?
- What will happen if the drug is treated with NH_2OH ?



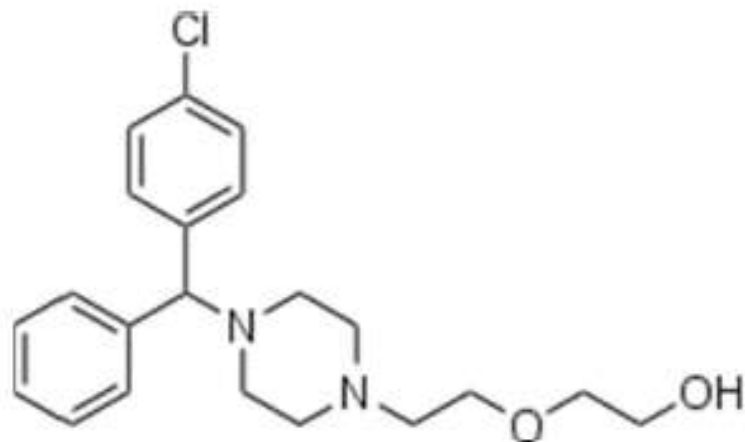
12] Sildenafil (Viagra)

- What will happen if the drug is treated with LiAlH_4 ?
- What will happen if the drug is treated with sodium hydroxide followed by acetic anhydride?
- What is the name of sulfur functionality in the drug?
- Draw the most reasonable expected salt. Justify your choice



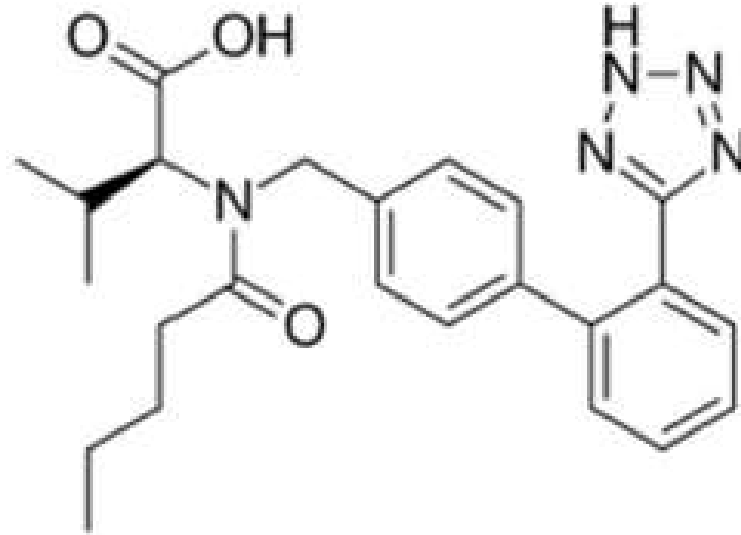
14] Lasix (Diuretic)

- Circle the sulphonamide part in the drug
- What is the name of the heterocyclic ring in the drug?
- What will happen; if the drug is heated with excess amount of NaOH then with 2-chlorothiazole?
- Draw the possible intramolecular H.B
- There is an opportunity for lactam to be formed. Explain



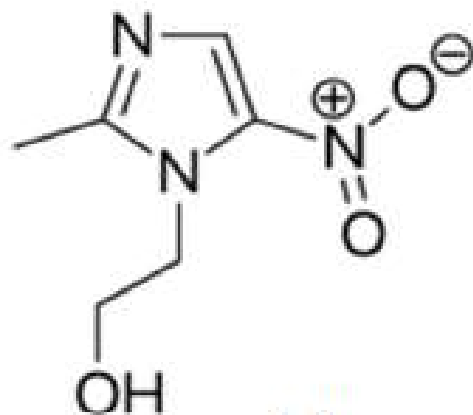
15] Hydroxyzine (Antihistamine)

- What will happen if the drug is heated with KMnO_4 ?
- What is the expected result upon its treating with NaCN followed by DIBAL?
- What will happen if the drug is treated with HCl ?
- What will happen if the drug is treated with acetic anhydride?



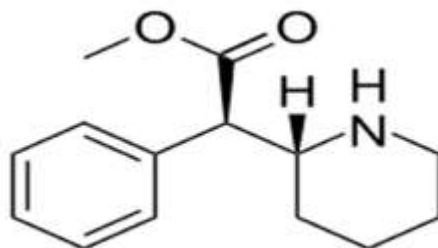
16] Valsartan (angiotensin receptor blocker)

- What is the names of heterocyclic ring?**
- Explain acidic hydrolysis of the drug**
- There are two possible salt forms; what are they?**
- Is the drug classified as acid or base? Explain**



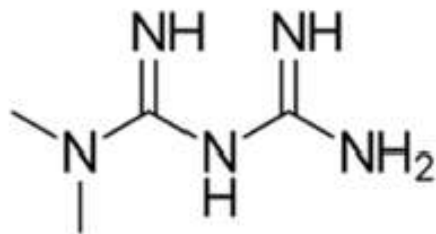
17] Flagyl (Antiprotozoal)

- What is the names of heterocyclic ring?
- Draw the possible intramolecular H.B
- Which is the most basic nitrogen? Explain
- What will happen if the drug is treated with KMnO₄/NaOH ?



18] Focalin (CNS stimulant)

- What is the names of heterocyclic ring?
- Draw the Zwitterion form for the drug
- Is the drug water-soluble? Explain
- What will happen if the drug is treated with CH_3MgBr ?
- What will happen if the drug is treated with $\text{KMnO}_4/\text{NaOH}$?



19] Glucophage [Treatment of type 2 diabetes]

- Indicate the most acidic proton
- Indicate the lowest basic nitrogen
- What is the expected product when the drug is treated separately with
 - phosgene
 - thionylchloride

أرجو من الله سبحانه وتعالى لكم التوفيق والسداد