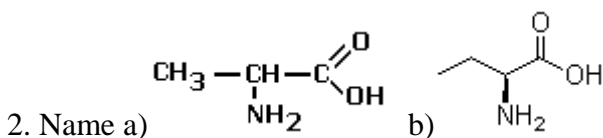
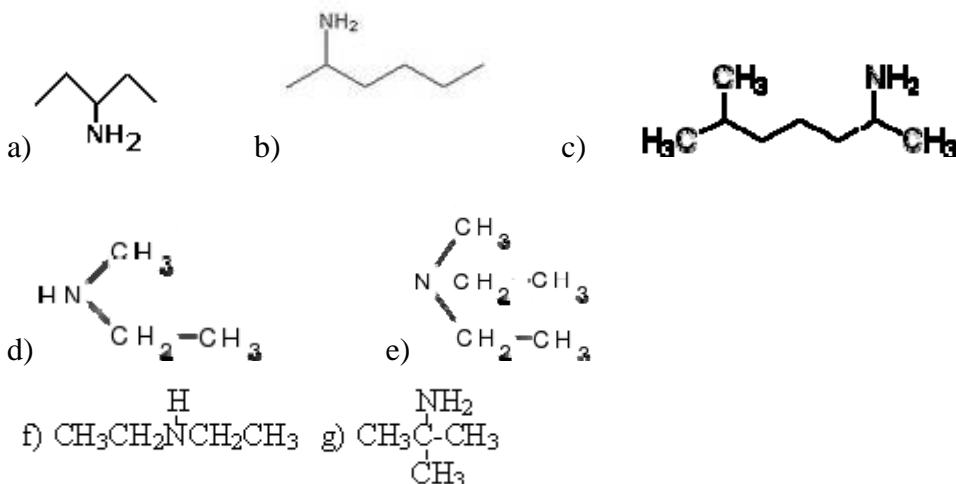


Amine Study Guide Question

1. Name the following molecules:



3. Draw the structure of: a) trimethylamine b) ethylmethylamine c) ethyldimethylamine d) triethylamine e) dipropylamine f) tripropylamine g) 5-amino-2,3-dimethylhexane h) 2-amino pentanoic acid

4. Explain why 3-aminobutane is not a correct IUPAC name. Draw the structure and think about it.

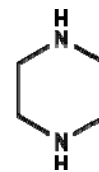
5. When triethylamine is dissolved in water, the pH of the solution is basic (alkaline). Explain why, writing the equation for the reaction which has occurred.

6. Draw piperidine a) in the “flat” shape and b) showing its true conformation. What is the bond angle in piperidine?

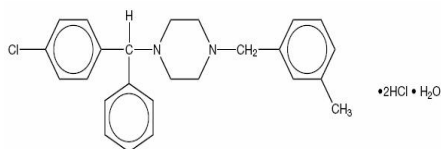
7. Give a practical use for piperine.

8. What was the original medical use for phencyclidine? Why was it never marketed? What are two “street names” for phencyclidine? What is the significance of the “phen” part of the name?

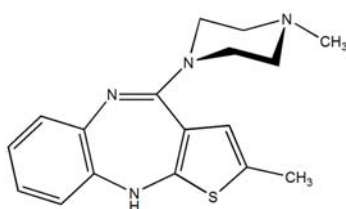
9. What is the medical use for quinine? What problems are there with taking quinine orally? What adverse effects can occur with quinine overdose? What common food product contains quinine (at very low concentrations)?



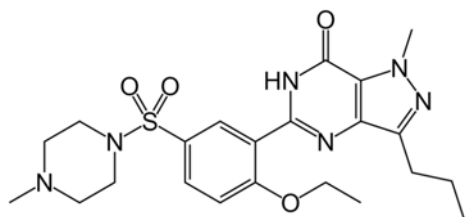
10. Piperazine (structure shown at right) is also found in many drug molecules. Draw piperazine in its real conformation. Identify the piperazine group in the drug molecules shown below.



Meclizine(Bonine) is used in treating nausea.

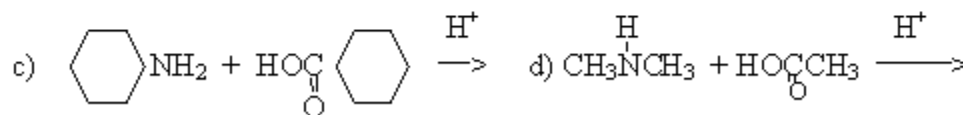
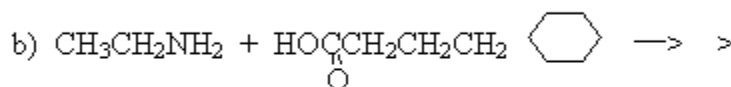
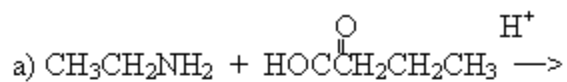


Olanzapine(Risperdal) is used to treat schizophrenia.

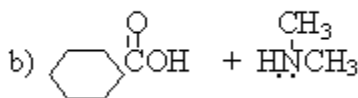
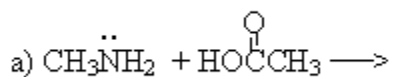


Sildenafil(Viagra) is used to treat erectile dysfunction.

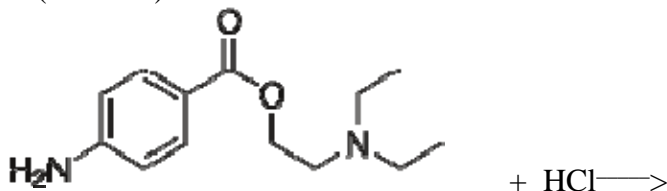
11. Draw the structure of the **amide** formed:



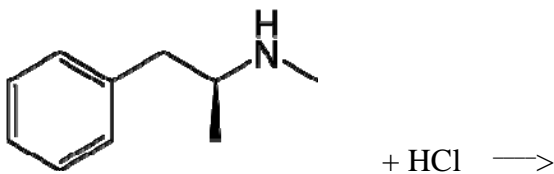
12. Show the products for the reactants shown below a) at low temperature where a simple acid-base reaction occurs b) at high temperature (or in the presence of a suitable catalyst) where formation of an amide occurs.



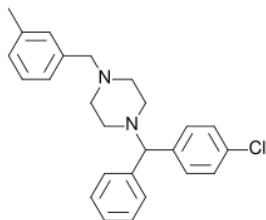
13. Write the structure of the product formed from the reaction of procaine (Novocaine) with hydrochloric acid. Would procaine or procaine hydrochloride be more soluble in water (or blood)?



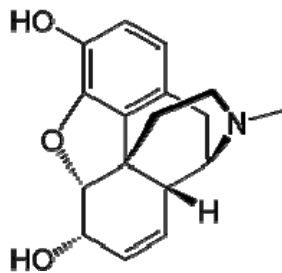
14. Answer the previous question for methamphetamine (structure shown below). Which form is the free base form of meth?



15. Meclizine (structure shown below) is an antihistamine and antiemetic that is administered as meclizine **di**hydrochloride. Suggest a reason why meclizine reacts with two molecules of HCl, based on its structure.



16.(skip) When morphine is extracted from the latex resin of opium poppies, the latex is normally dissolved in a solution of sulfuric acid.



1) Explain why the morphine will be soluble when an acid such as H_2SO_4 is added. Show the equation for the reaction that occurs. You do not have to draw the whole structure of morphine but show the portion that reacts.

Fiber and insoluble residue is filtered off and the aqueous solution is then made basic with a base such as sodium bicarbonate. This process causes the morphine alkaloid to precipitate.

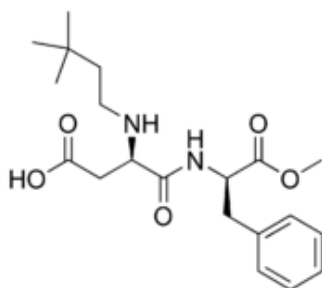
2) Write the equation for the reaction that occurs and explain why the addition of sodium bicarbonate makes the morphine less soluble in water.

The morphine precipitate is then redissolved in a solvent such as ether and crystallized upon evaporating off the ether.

3) Why is this form of the morphine soluble in ether but not in water?

17. Explain what happens to NutraSweet when it is ingested and the basis for concerns for aspartame toxicity if it is eaten in large quantities.

18. Neotame (structure shown below) has a structure similar to aspartame except that the N of the amide bond has an additional dimethyl butyl group attached. Give some of the advantages of neotame over aspartame.



19. Explain why penicillin is a very reactive molecule. What is the specific name for the reactive ring? How do bacteria inactivate it? How can this inactivation be prevented?

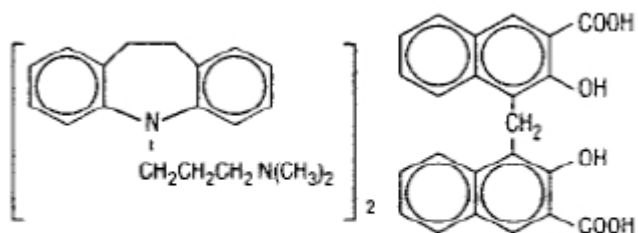
20. What type of functional groups link the monomers of Nylon? How is the structure of Nylon 66 similar to that of amino acids? Name a dental use of nylon.

21. Explain the probable reason why melamine was added to pet food and what deficiency was being remedied. Would the melamine be of any nutritional value to cats and dogs? What animals could utilize the melamine and why? Discuss why or why melamine by itself is likely to be the cause of many pet deaths. What theory has been proposed?

22. What is the purpose of adding chloramine to drinking water? In what medical situations does it need to be removed?

23. The structure of the tricyclic antidepressant imipramine pamoate (Tofranil) is shown below. The actual drug molecule, imipramine, is shown on the left. Why is it called a

tricyclic? The pamoate molecule is on the right. Suggest what the function of the



pamoate is. $(C_{19}H_{24}N_2)_2 \cdot C_{23}H_{16}O_6$

M.W. = 949.21

24. The drug insert on donepezil (Aricept) (a drug for Alzheimer's) warns that people allergic to piperidine drugs should not use Aricept. Circle the piperidine ring in the structure of donepezil shown below. Draw the piperidine, showing its real shape.

