

MC_Chem12B_Sp11_LecTest1

Answer Section

SHORT ANSWER

1. ANS:

1-methyl-2,4-benzenediamine or 2,4-diaminotoluene

PTS: 1

2. ANS:

(E)-2-ethylbut-2-en-1-ol

PTS: 1

3. ANS:

The carbocation is sp^2 -hybridized, so if the oxygen is also sp^2 -hybridized then each atom in the cycle has a conjugated p -orbital. Each double bond contributes two pi electrons and the oxygen contributes two pi electrons, for a total of six pi electrons in the conjugated system. Therefore, this species is predicted to show aromatic character.

PTS: 1

4. ANS:

This compound, [16]annulene, appears to be a cyclic, planar, conjugated molecule with 16 pi electrons. However, 16 is not a Hückel number, so the compound is probably not planar, and is not aromatic.

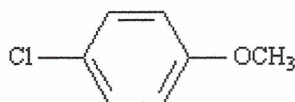
PTS: 1

5. ANS:

The formula C_7H_7ClO corresponds to a base formula of C_7H_8 . A saturated formula is C_7H_{16} so there are $(16 - 8) \div 2 = 4$ degrees of unsaturation.

PTS: 1

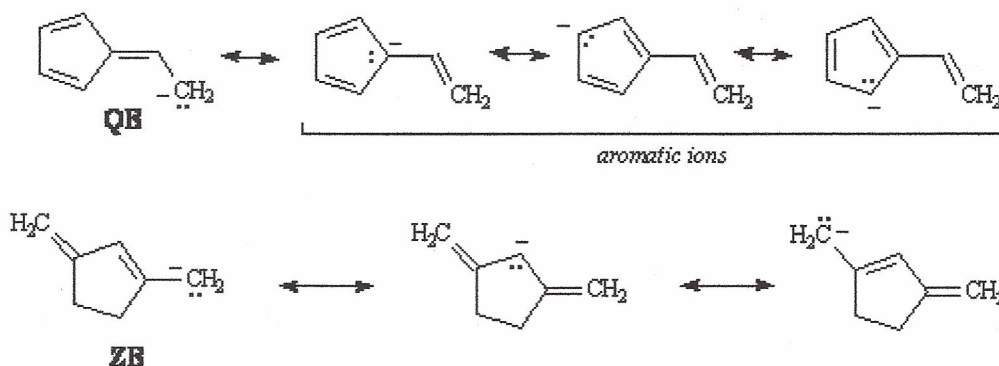
6. ANS:



PTS: 1

7. ANS:

The conjugate bases of Compounds **Q** and **Z** are both resonance stabilized. Let's examine all resonance structures for both conjugate bases:



For the conjugate base **QB** the negative charge is delocalized into the ring. This generates a cyclopentadienyl anion that is aromatic. For the conjugate base **ZB**, the negative charge is delocalized by resonance but no aromatic ions result. Therefore, Compound **Q** should be the most acidic, since its anion is the most stable.

PTS: 1

8. ANS:

g

PTS: 1

9. ANS:

b

PTS: 1

10. ANS:

d

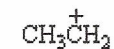
PTS: 1

11. ANS:

h

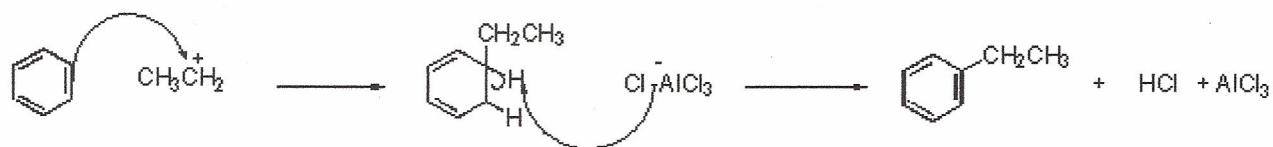
PTS: 1

12. ANS:



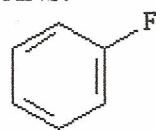
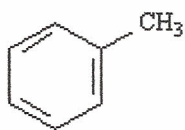
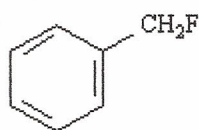
PTS: 1

13. ANS:



PTS: 1

14. ANS:

312

PTS: 1

15. ANS:

A

PTS: 1

16. ANS:

C

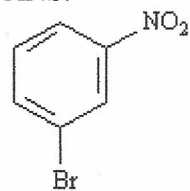
PTS: 1

17. ANS:

slower

PTS: 1

18. ANS:



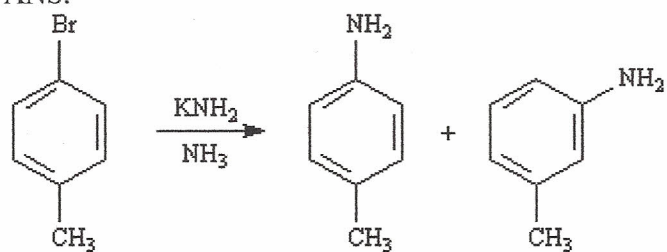
PTS: 1

19. ANS:

N.R. Nucleophilic Aromatic Substitution requires an electron-withdrawing group in the ortho or para position. A methyl group is electron donating, and substitution will not occur.

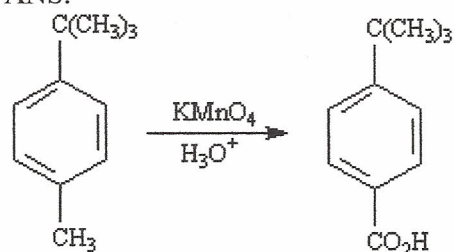
PTS: 1

20. ANS:



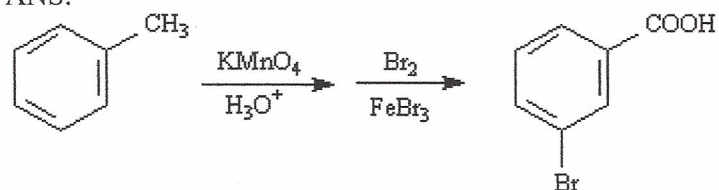
PTS: 1

21. ANS:



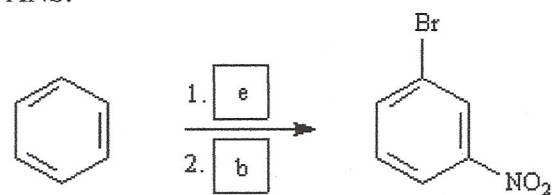
PTS: 1

22. ANS:



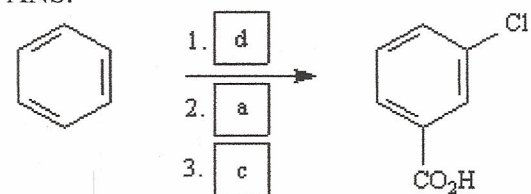
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23. ANS:



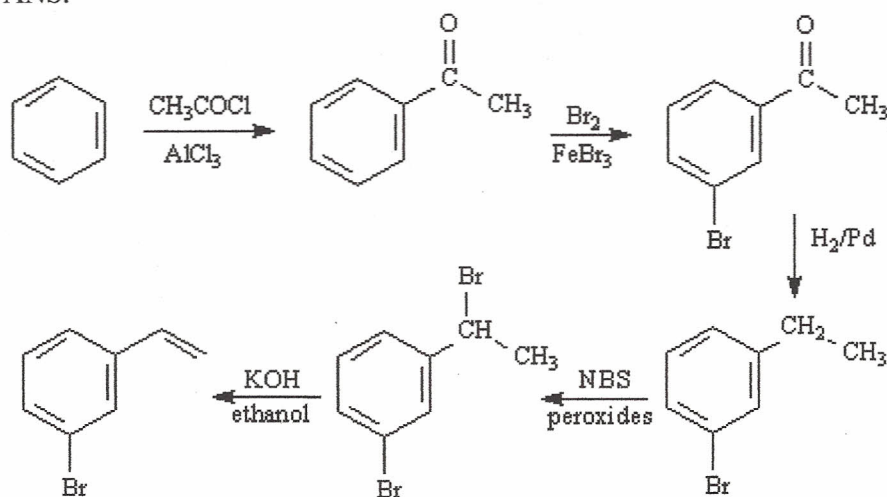
PTS: 1

24. ANS:



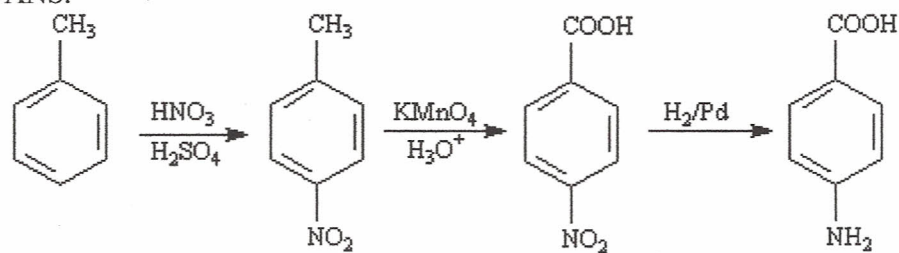
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25. ANS:



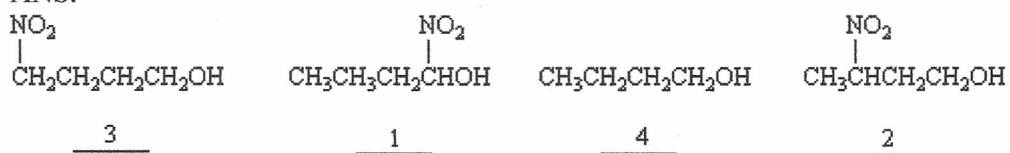
PTS: 1

26. ANS:



PTS: 1

27. ANS:



PTS: 1

28. ANS:

d

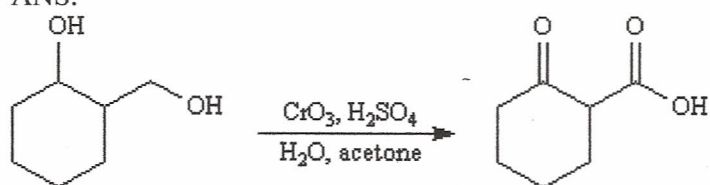
PTS: 1

29. ANS:

b

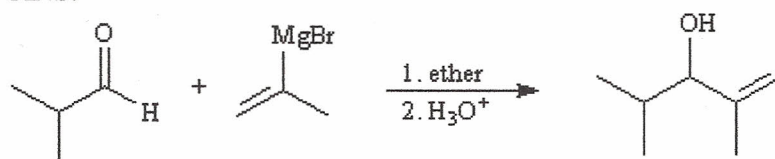
PTS: 1

30. ANS:



PTS: 1

31. ANS:



PTS: 1

32. ANS:

f

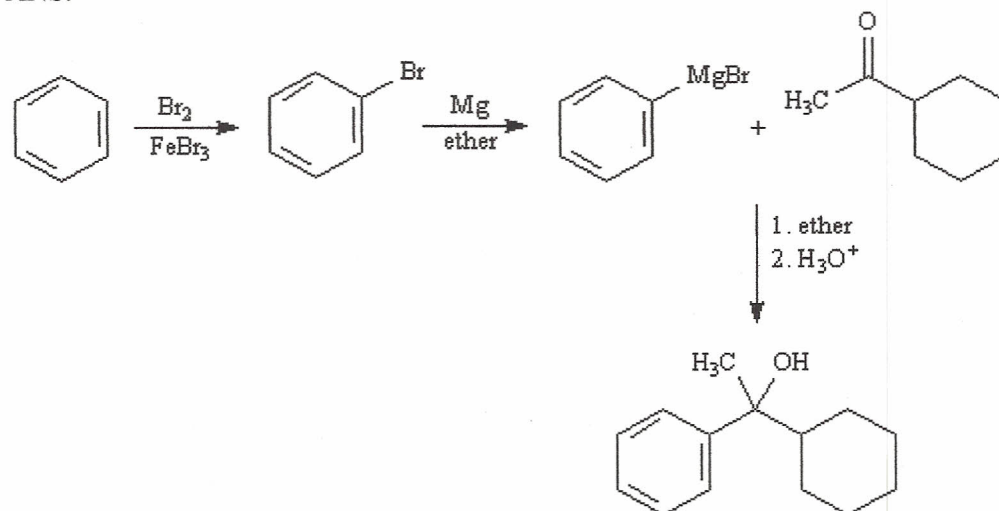
PTS: 1

33. ANS:

c

PTS: 1

34. ANS:



PTS: 1