QB365 Question Paper Software
12th Standard - Chemistry
Amines Assertion and reason

Exam Time: 00:20 Hrs | Date: 2025-10-01
Total Marks: 10

Questions:

1. In the following questions. an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.
Assertion (A) Aromatic primary amines cannot be prepared by Gabriel phthalimide synthesis.
Reason (R) Aryl halides do notundergo electrophilic substitution with anion formed by phthalimide.
Codes:
(a) Both (A) and (R) are correct, (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).
(c) (A) is correct; (R) is incorrect.
(d) (A) is incorrect; (R) is correct.

2. In the following questions. an Assertion (A) is followed by a corresponding Reason (R) Use the following keys to choose the appropriate answer.
Assertion (A) Aniline does not undergo alkylation and acetylation.
Reason (R) Nitrogen of aniline acquires positive charge in the presence of $AlCI_3$.
Codes:
(a) Both (A) and (R) are correct, (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).
(c) (A) is correct; (R) is incorrect.
(d) (A) is incorrect; (R) is correct.

3. In the following questions. an Assertion (A) is followed by a corresponding Reason (R) Use the
following keys to choose the appropriate answer.
Assertion (A) Acetanilide is less basic than aniline.
Reason (R) Acetylation of aniline results in decrease in decrease of electron density of nitrogen.
Codes:
(a) Both (A) and (R) are correct, (R) is the correct explanation of (A).
(b) Both (A) and (R) are correct, (R) is not the correct explanation of (A).
(c) (A) is correct; (R) is incorrect.
(d) (A) is incorrect; (R) is correct.

4. **Assertion:** In order to convert R-CI to pure $R\text{-}NH_2$, Gabriel pthalimide synthesis can be used.
Reason: With proper choice of alkyl halides, pthalimide synthesis can be used to prepare 1°,2° or 3° amine.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct

explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

5. **Assertion:** Aniline is a weaker base than ethylamine.
Reason: Lower the value of pK_b stronger is the base.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

6. **Assertion:** Ammonia is more basic than water.
Reason: Nitrogen is less electronegative than oxygen.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

7. **Assertion:** Aniline hydrogen sulphate, on heating, forms p-aminosulphonic acid.
Reason: The sulphonic acid group is electron-withdrawing.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

8. **Assertion:** Controlled nitration of aniline at low temperature mainly gives m-nitroaniline.
Reason: In acidic medium, $-NH_2$ group gets converted into m-directing group.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

9. **Assertion:** Nitration of aniline can be done conveniently by protecting the amino group by acetylation.
Reason: Acetylation increases the electron density in the benzene ring.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct

explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

10. **Assertion:** In strongly acidic solutions, aniline becomes more reactive towards electrophilic reagents.
Reason: The amino group being completely protonated in strongly acidic solution, the lone pair of electrons on the nitrogen is no longer available for resonance.
Codes:
(a) Assertion and reason both are correct statements and reason is correct explanation for assertion.
(b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.
(c) Assertion is correct statement but reason is wrong statement.
(d) Assertion is wrong statement but reason is correct statement.

Answers Key:

1. (c) Aromatic primary amines cannot be prepared by the Gabriel phthalimide synthesis because aryl halides do not undergo nucleophilic substitution reaction with the anion formed by phthalimide. Thus, (A) is correct but (R) is incorrect
2. (a) Aniline does not undergo Friedel Crafts reaction (alkylation and acetylation) due to salt formation with $AlCI_3$, (the Lewis acid) which is used as a catalyst. Due to this, nitrogen of aniline acquires positive charge and hence, acts as a strong deactivating group for further reaction. Thus, both (A) and (R) are correct and (R) is the correct.
3. (a) Both A and R are correct and R is the correct explanation of A.
4. **(c):** Only primary aliphatic amines can be prepared by Gabriel phthalimide reaction.
5. **(b):** The lone pair of electrons on the N-atom in aniline is delocalized over the benzene ring and is less easily available for protonation. Therefore, aniline is a weaker base than ethylamine.
6. **(a):** Ammonia is more basic than water. It is because nitrogen being less electronegative than oxygen, has a greater tendency to donate electrons
7. **(b):** $-NH_2$ being o,p-directing group directs $-SO_3H$ group to less hindered p-position.
8. **(a):** Under acidic condition, aniline gets protonated to anilinium ion ($-NH_3^+$ group). This is deactivating and m-directing group. Thus, controlled nitration of aniline mainly gives m-nitroaniline.
9. **(c):** Acetylation decreases the electron density in the benzene ring and deactivate the ring hence control the reaction.
10. **(d):** In strongly acidic medium, aniline gets protonated and so the lone pair of electrons is not available to produce +E or +M effects. On the other + hand, the $-NH_3$ group exerts strong -I effect and thus it causes the deactivation of the ring.