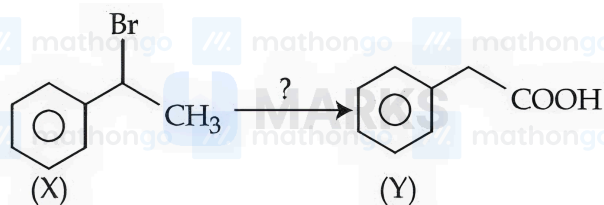


Q1. JEE Main 2026 (23 January Shift 1)



The correct sequence of reagents for the above conversion of X to Y is :

- (1) (i) NaOH(aq); (ii) Jones reagent; (iii) H_3O^+
- (2) (i) $\text{B}_2\text{H}_6/\text{H}_2\text{O}_2$; (ii) NaOEt; (iii) Jones reagent
- (3) (i) Jones reagent; (ii) NaOEt; (iii) Hot KMnO_4/KOH
- (4) (i) NaOEt; (ii) $\text{B}_2\text{H}_6/\text{H}_2\text{O}_2$; (iii) Jones reagent

Q2. JEE Main 2026 (23 January Shift 1)

Match List - I with List - II.

List - I

Functional group (detection)

A. Unsaturation (Baeyer's test)

B. Alcoholic group

(Ceric ammonium nitrate test)

C. Aldehyde group (Tollen's reagent)

D. Phenolic group (FeCl_3 test)

List - II

Change observed during detection

I. Red colour appears

II. Silver mirror appears

III. Violet colour appears

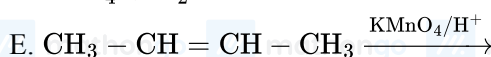
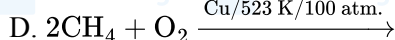
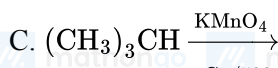
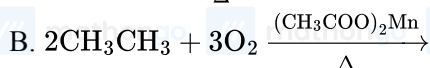
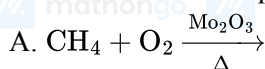
IV. Discharge of pink colour

Choose the correct answer from the options given below :

- (1) A-III, B-IV, C-II, D-I
- (2) A-IV, B-I, C-II, D-III
- (3) A-IV, B-III, C-II, D-I
- (4) A-III, B-IV, C-I, D-II

Q3. JEE Main 2026 (28 January Shift 2)

The reactions which produce alcohol as the product are:

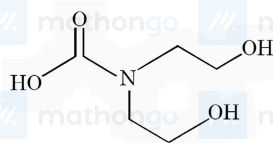


Choose the correct answer from the options given below :

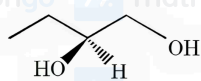
- (1) A, C and E Only
- (2) A and D Only
- (3) C and D Only
- (4) B, D and E Only

Q4. JEE Main 2026 (24 January Shift 2)

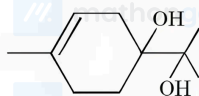
From the following, how many compounds contain at least one secondary alcohol?



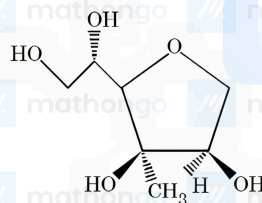
(I)



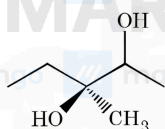
(II)



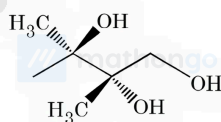
(III)



(IV)



(V)



(VI)

Choose the correct answer from the options given below:

(1) Three

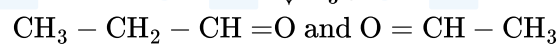
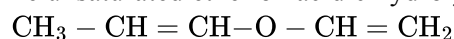
(2) Five

(3) Four

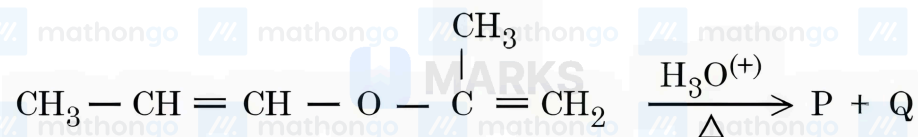
(4) Two

Q5. JEE Main 2026 (24 January Shift 2)

The unsaturated ether on acidic hydrolysis produces carbonyl compounds as shown below:-



Based on this, predict the solution/reagent that will help to distinguish "P" and "Q" obtained in the following reaction:-



(1) Fehling solution

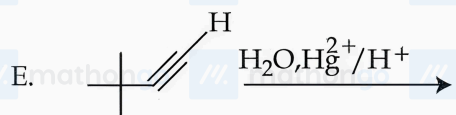
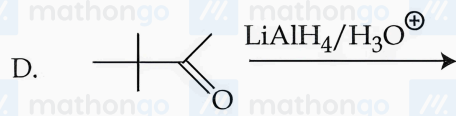
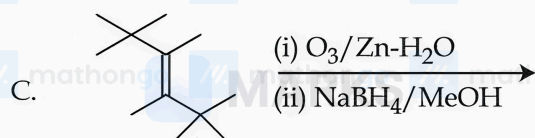
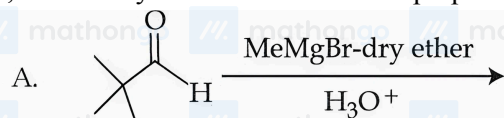
(2) Lucas reagent

(3) 2, 4 - DNP reagent

(4) Saturated NaHSO_3 solution

Q6. JEE Main 2026 (22 January Shift 2)

3, 3-Dimethyl-2-butanol cannot be prepared by :



Choose the correct answer from the options given below :

(1) B and C Only

(2) B and E Only

(3) B Only

(4) B, C and E Only

Q7. JEE Main 2026 (22 January Shift 1)

Given below are two statements:

Statement I: Phenol on treatment with CHCl_3 / aq. KOH under refluxing condition, followed by acidification produces *p*-hydroxy benzaldehyde as the major product and *o*-hydroxy benzaldehyde as the minor product.

Statement II: The mixture of *p*-hydroxybenzaldehyde and *o* hydroxybenzaldehyde can be easily separated through steam distillation.

In the light of the above statements, choose the correct answer from the options given below

(1) Statement I is true but Statement II is false

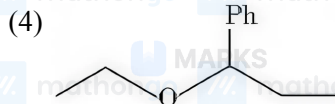
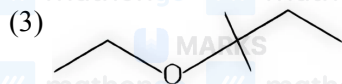
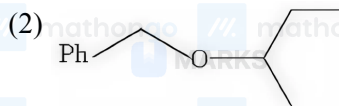
(2) Statement I is false but Statement II is true

(3) Both Statement I and Statement II are true

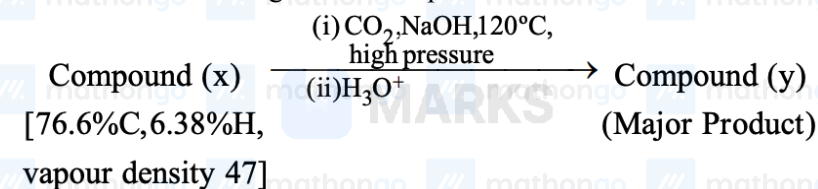
(4) Both Statement I and Statement II are false

Q8. JEE Main 2026 (23 January Shift 2)

A mixed ether (P), when heated with excess of hot concentrated hydrogen iodide produces two different alkyl iodides which when treated with aq. NaOH give compounds (Q) and (R). Both (Q) and (R) give yellow precipitate with NaOI. Identify the mixed ether (P) :

**Q9. JEE Main 2026 (28 January Shift 1)**

Consider the following reaction sequence



Compound (y) develops characteristic colour with neutral FeCl_3 solution. Identify the INCORRECT statement from the following for the above sequence.

- (1) Compound y will dissolve in NaHCO_3 and evolve a gas.
- (2) Both compounds x and y will dissolve in NaOH.
- (3) Both compounds x and y will burn with sooty flame.
- (4) Compound x is more acidic than compound y.

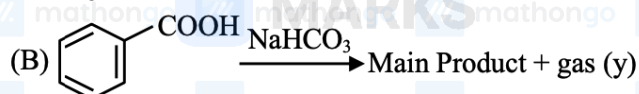
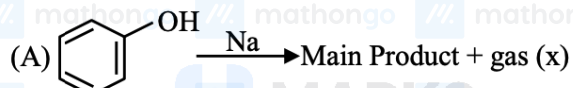
Q10. JEE Main 2026 (24 January Shift 1)

A hydroxy compound (X) with molar mass 122 g mol^{-1} is acetylated with acetic anhydride, using a large excess of the reagent ensuring complete acetylation of all hydroxyl groups. The product obtained has a molar mass of 290 g mol^{-1} . The number of hydroxyl groups present in compound (X) is:

- (1) 5 (2) 2 (3) 4 (4) 3

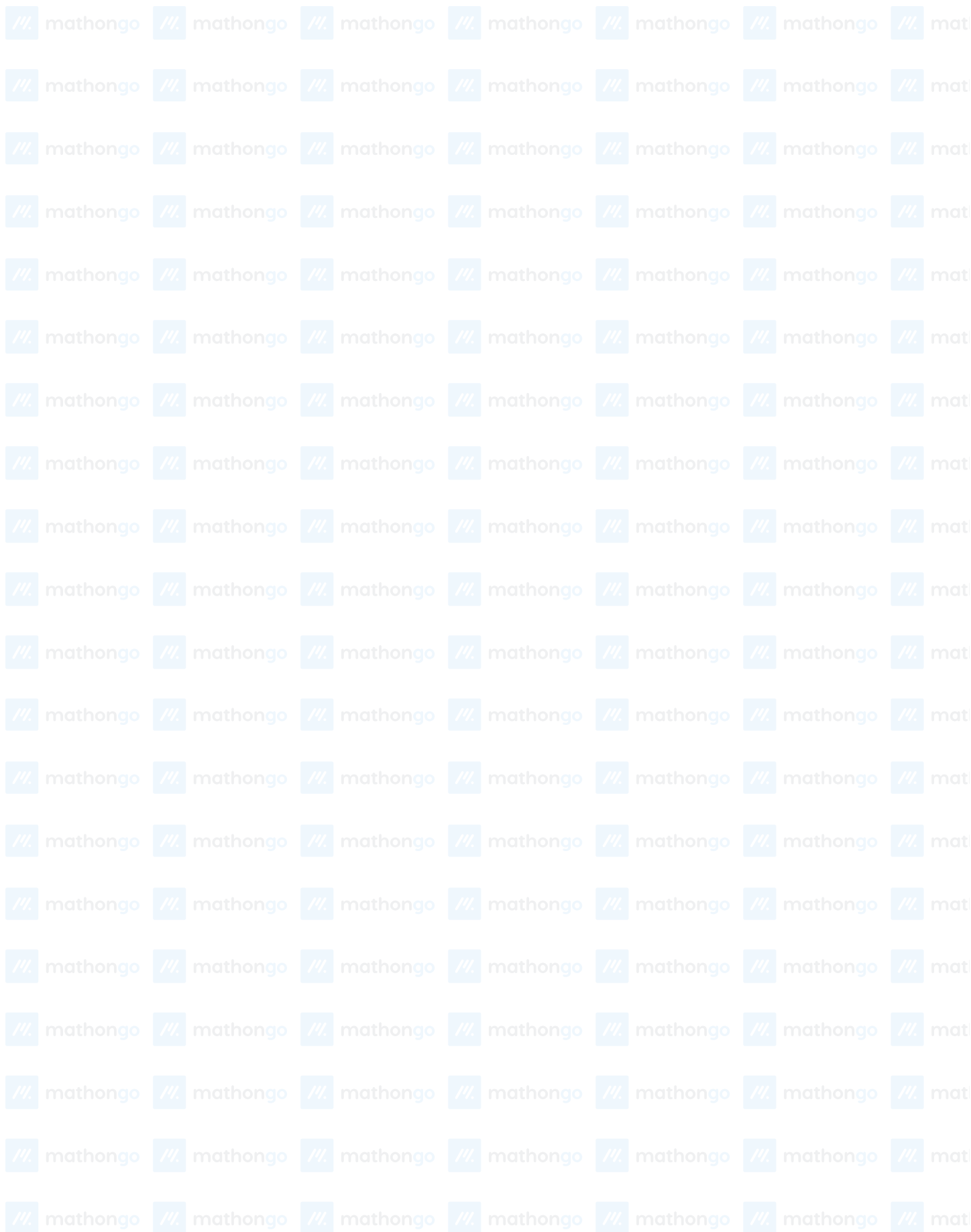
Q11. JEE Main 2026 (24 January Shift 1)

Consider the following two reactions A and B.



Numerical value of [molar mass of x + molar mass of y] is ____.

- (1) 160 (2) 4 (3) 88 (4) 46

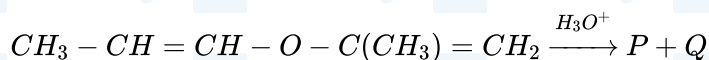


ANSWERS AND SOLUTIONS

1. (4) 2. (2) 3. (3) 4. (1) 5. (1) 6. (2) 7. (2) 8. (1)
9. (4) 10. (3) 11. (4)

- (4)** The transformation of (X) benzene with Br and CH₃ substituents to (Y) benzene with CH₂COOH requires:
First, NaOEt causes elimination of HBr to form an alkene intermediate.
Second, B₂H₆/H₂O₂ performs hydroboration-oxidation, adding hydroxyl group in anti-Markovnikov fashion to yield a primary alcohol.
Third, Jones reagent oxidizes the primary alcohol to carboxylic acid.
The sequence NaOEt → B₂H₆/H₂O₂ → Jones reagent produces the desired carboxylic acid product.
- (2)** Unsaturation (Baeyer's test) involves decolorization of the reagent, represented by discharge of color (IV).
Alcoholic groups (Ceric ammonium nitrate test) produce a red color (I).
Aldehyde groups (Tollen's reagent) produce a characteristic silver mirror effect (II).
Phenolic groups (FeCl₃ test) produce a violet or pink color (III).
The correct matching is A-IV, B-I, C-II, D-III.
- (3)** Analyzing each reaction for alcohol production:
Reaction A: $\text{CH}_4 + \text{O}_2 \xrightarrow{\text{Mo}_2\text{O}_3, \Delta}$ produces formaldehyde, not alcohol.
Reaction B: $2\text{CH}_3\text{CH}_3 + 3\text{O}_2 \xrightarrow{(\text{CH}_3\text{COO})_2\text{Mn}, \Delta}$ produces acetic acid, not alcohol.
Reaction C: $(\text{CH}_3)_3\text{CH} \xrightarrow{\text{KMnO}_4}$ tert-butyl compound undergoes oxidation to produce tert-butyl alcohol as the primary product.
Reaction D: $2\text{CH}_4 + \text{O}_2 \xrightarrow{\text{Cu}/523\text{K}/100\text{atm}}$ produces methanol (CH₃OH), a primary alcohol.
Reaction E: The diene compound with KMnO_4/H^+ produces vicinal diol, which is technically an alcohol but not a simple monoalcohol.
The reactions that predominantly produce alcohols as main products are C and D.
- (1)** A secondary alcohol has the OH group on a carbon bonded to exactly two other carbon atoms. Analyzing each structure:
I contains only primary alcohols and carboxylic acid.
II has OH on a carbon bonded to two other carbons (secondary alcohol).
III has tertiary and primary alcohols only.
IV has secondary alcohols on the cyclopentanone ring.
V has OH on a secondary carbon (between two CH groups).
VI has the central carbon as tertiary with three OH groups.
Compounds II, IV, and V contain at least one secondary alcohol, giving total = 3.

5. (1) Acidic hydrolysis of vinyl ethers involves the addition of water across the double bond followed by the elimination of alcohol/phenol to form carbonyl compounds. In the given reaction:



The hydrolysis occurs at both vinyl ether linkages.

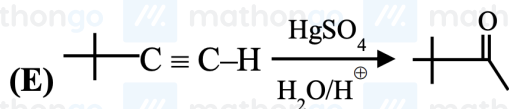
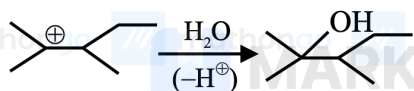
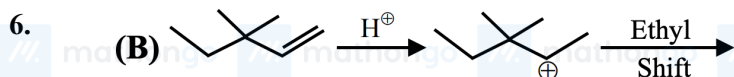
The left part $CH_3 - CH = CH - O -$ hydrolyzes to form propanal: $CH_3 - CH_2 - CHO$ (P).

The right part $-O - C(CH_3) = CH_2$ hydrolyzes to form acetone: $CH_3 - CO - CH_3$ (Q).

P is an aldehyde (propanal) and Q is a ketone (acetone).

Fehling solution is used to distinguish between aldehydes and ketones. Aldehydes (except benzaldehyde) reduce Fehling solution to give a red precipitate of Cu_2O , while ketones do not react.

Lucas reagent is used for alcohols. 2,4-DNP reacts with both aldehydes and ketones. Saturated $NaHSO_3$ reacts with most aldehydes and methyl ketones, so it is not the best choice for distinguishing these specific compounds compared to Fehling solution.



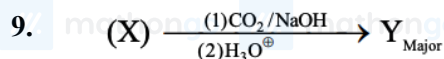
7. (2) Statement I: The reaction of phenol with $CHCl_3$ and aqueous KOH is the Reimer-Tiemann reaction. In this reaction, the major product is *o*-hydroxybenzaldehyde (salicylaldehyde) due to the formation of a stable six-membered chelate ring via intramolecular hydrogen bonding. *p*-hydroxybenzaldehyde is formed as the minor product. Thus, Statement I is false.

Statement II: *o*-hydroxybenzaldehyde (salicylaldehyde) has intramolecular hydrogen bonding, making it more volatile (steam volatile). *p*-hydroxybenzaldehyde has intermolecular hydrogen bonding, which leads to association between molecules and a higher boiling point, making it non-steam volatile. Therefore, the mixture can be easily separated by steam distillation. Thus, Statement II is true.

Conclusion: Statement I is false but Statement II is true.

8. (1) The mixed ether (P) upon heating with conc. HI undergoes cleavage to form two different alkyl iodides. Treatment with aq. NaOH converts these iodides to alcohols (Q) and (R). Both (Q) and (R) giving yellow precipitate with NaOI indicates both are secondary or primary alcohols capable of iodoform reaction. For both cleavage products to yield iodoform-positive alcohols, the mixed ether must have both alkyl groups capable of forming such alcohols.

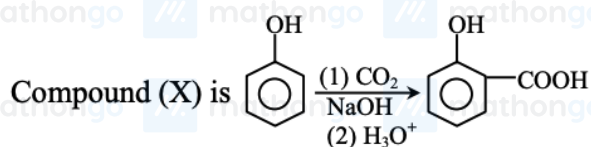
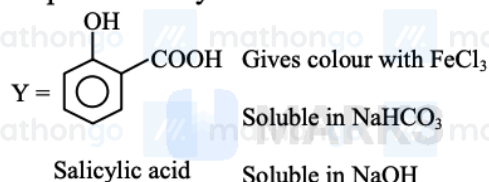
Option (1) represents a symmetric mixed ether where both fragments upon HI cleavage yield alcohol products with methyl groups adjacent to OH (secondary alcohols) or methyl ketones after oxidation, both giving positive iodoform test.



76.6% C

6.38% H

Vapour Density 47



(4) Kolbe Schmitt reaction

10. (3) In acetylation, each hydroxyl group reacts:



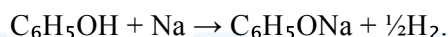
Each -OH is converted to -OCOCH₃, resulting in a net mass increase of 42 g/mol per hydroxyl group (addition of acetyl group mass 43, removal of hydrogen mass 1).

Given: Original molar mass = 122 g/mol, Product molar mass = 290 g/mol

Total mass increase = 290 - 122 = 168 g/mol

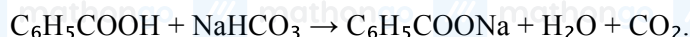
Number of hydroxyl groups = 168 ÷ 42 = 4

11. (4) Reaction A: Phenol reacts with metallic sodium to produce sodium phenoxide and hydrogen gas.



The gas evolved is x = H₂ with molar mass 2 g/mol.

Reaction B: Benzoic acid reacts with sodium bicarbonate to produce sodium benzoate, water, and carbon dioxide.



The gas evolved is y = CO₂ with molar mass 44 g/mol.

Therefore, molar mass of x + molar mass of y = 2 + 44 = 46.