

# Saitechinfo NEET-JEE Academy

Here are the **detailed solutions** to the **word problems based on Alcohols**:

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## ✓ Solutions – Alcohols Word Problems

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### 1. Hydrogen Gas Evolved

Given:

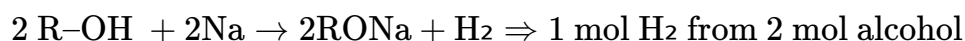
- Mass of alcohol = 4.6 g
- Volume of H<sub>2</sub> = 1.12 L at STP

#### Step 1: Moles of H<sub>2</sub>

$$\text{Moles of H}_2 = \frac{1.12}{22.4} = 0.05 \text{ mol}$$

#### Step 2: Moles of alcohol

From the reaction:



So, moles of alcohol =  $0.05 \times 2 = 0.1 \text{ mol}$

#### Step 3: Molar mass

$$\text{Molar mass} = \frac{4.6 \text{ g}}{0.1 \text{ mol}} = 46 \text{ g/mol}$$

**Answer:** C<sub>2</sub>H<sub>6</sub>O → Ethanol

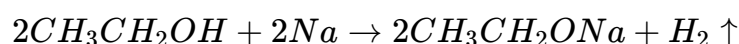
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### 2. Conversion Puzzle

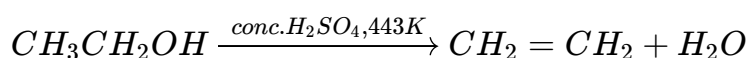
- Compound A: C<sub>2</sub>H<sub>6</sub>O → reacts with Na → gives H<sub>2</sub> → must be alcohol
- Heating with conc. H<sub>2</sub>SO<sub>4</sub> → gives ethene → must be **ethanol**

**Reactions:**

(a) With Na:



(b) Dehydration:



### 3. Functional Group Identification

- $C_4H_{10}O$  → oxidized to a **ketone** → so it is a **secondary alcohol**
- No reaction with Lucas reagent at room temperature → **primary alcohol**

Contradiction? Let's check again.

Ah! The **real interpretation**:

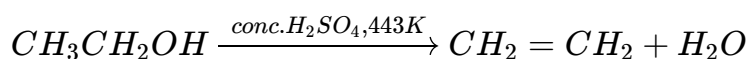
- **Doesn't react with Lucas reagent fast** = **secondary alcohol**
- Forms **ketone** = secondary confirmed.

**B = Butan-2-ol, C = Butan-2-one (methyl ethyl ketone)**

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#### 4. Dehydration Mechanism

**Reaction:**



**Mechanism (E1):**

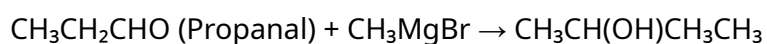
1. **Protonation** of -OH
2. **Loss of water** → forms carbocation
3. **Elimination** of  $H^+$  → alkene formation

**Name: Acid-catalyzed dehydration of alcohol**

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#### 5. Grignard Reaction

**Reaction:**



After hydrolysis → **2-butanol**

**Answer: X = 2-butanol**

Type of alcohol = **Secondary alcohol**

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#### 6. Victor Meyer Test Interpretation

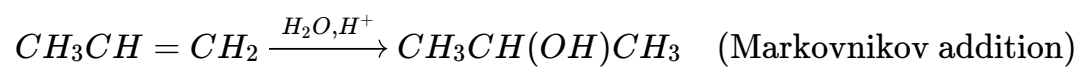
**Red Colour** → **Primary alcohol**

**Steps:**

1. Alcohol → alkyl iodide (with red P +  $I_2$ )
  2. Alkyl iodide → nitroalkane ( $AgNO_2$ )
  3. Nitroalkane → diazonium salt ( $HNO_2$  + base)
  4. Coupling with base → red dye = **Primary alcohol**
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#### 7. Interconversion Challenge

**(a)** Propene → Propan-2-ol



**(b)** Ethanol → Ethanoic acid

