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Class - 10

Chapter - 2

ACIDS, BASES AND SALTS

Part-9

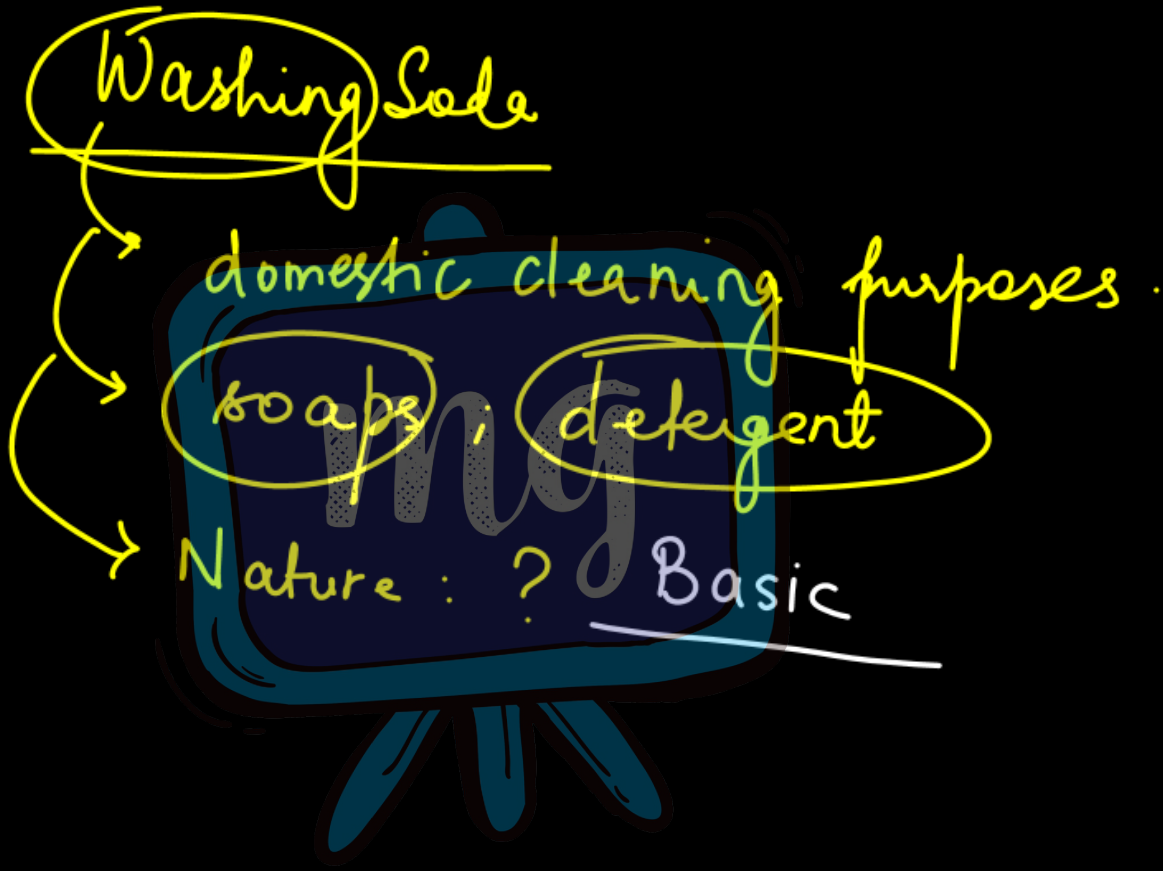
Some Important Salts - 3



Disha Didi (DD)

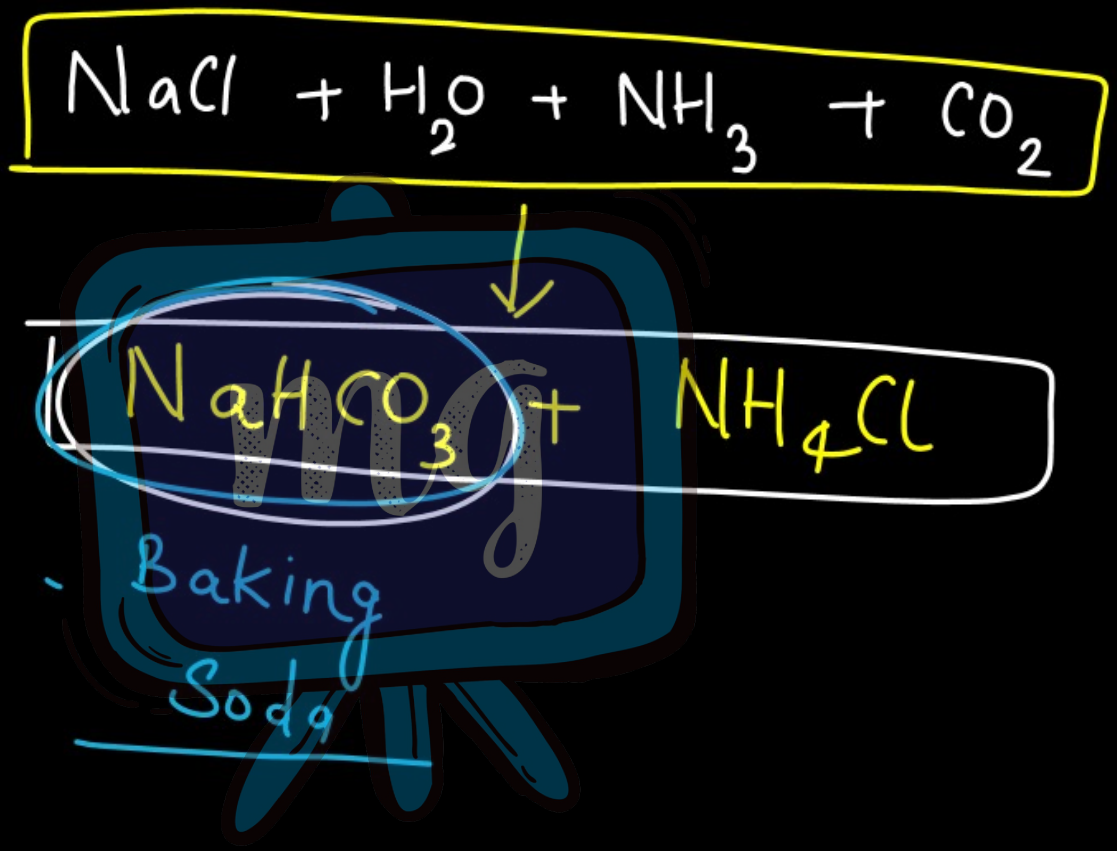
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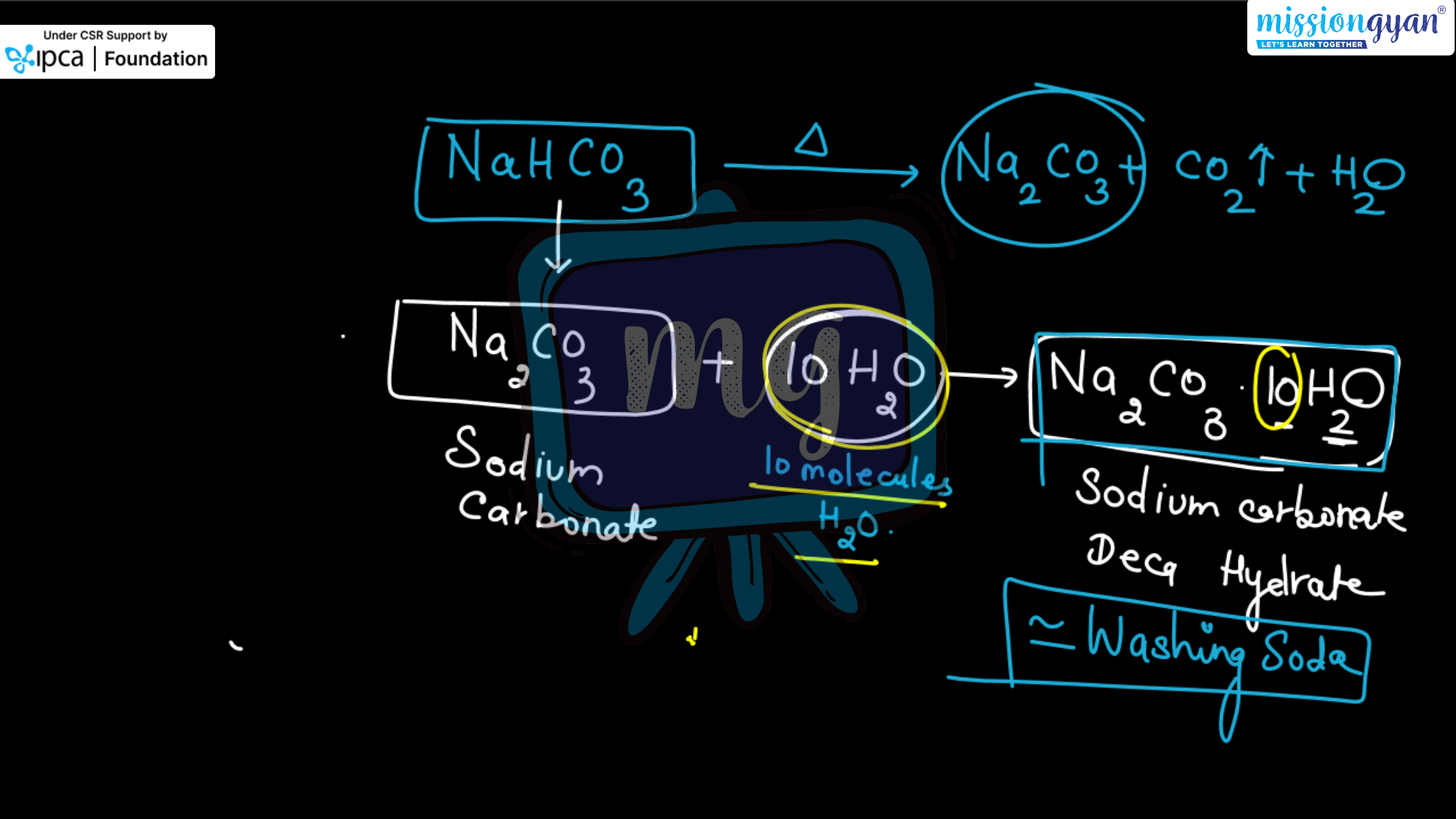
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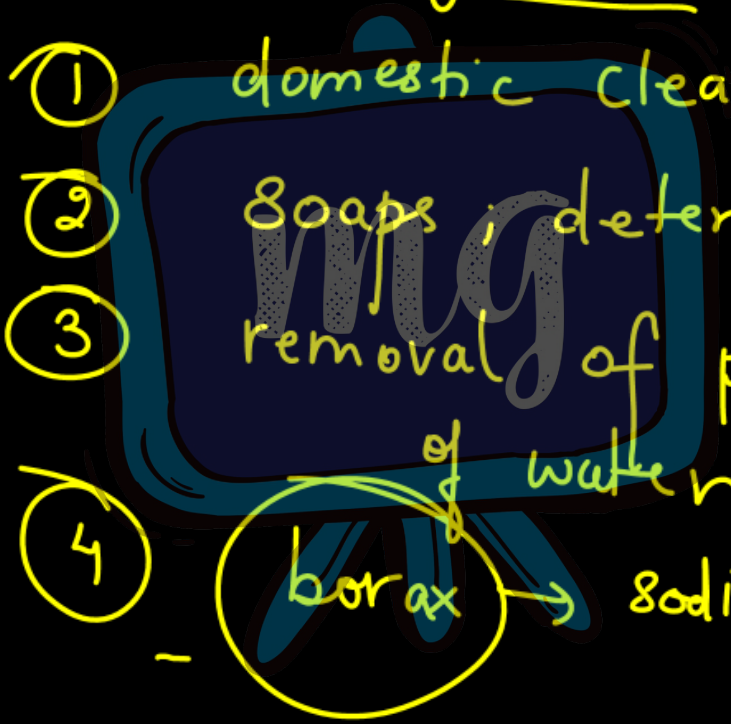


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Washing Soda

1. domestic cleaning
2. soaps ; detergent
3. removal of permanent hardness of water
4. borax → sodium compound

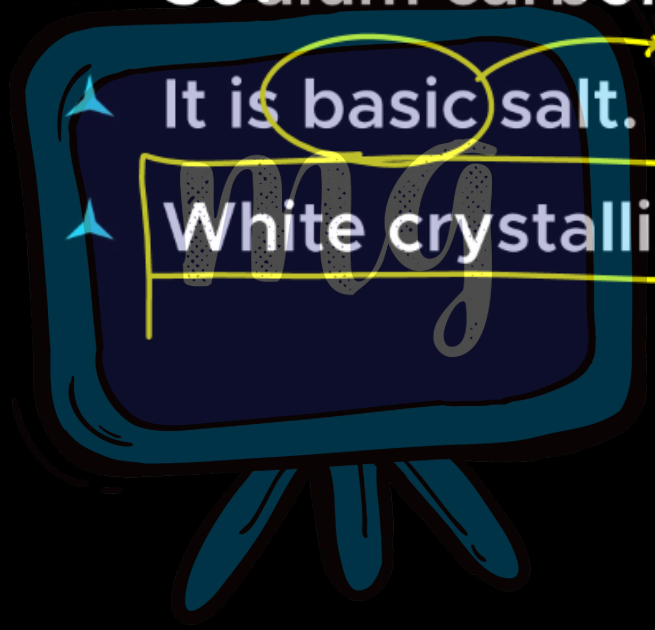


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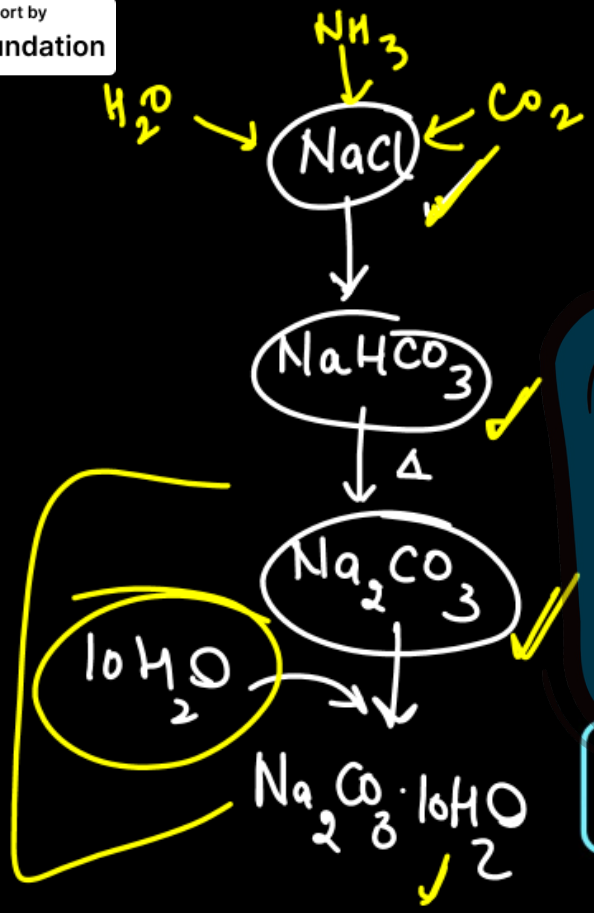
5. Washing Soda ($Na_2CO_3.10H_2O$)—

- Sodium carbonate deca-hydrate.
- It is basic salt.
- White crystalline solid.



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- Sodium carbonate can be obtained by heating baking soda; recrystallisation of sodium carbonate gives washing soda.

$$Na_2CO_3 + 10H_2O \longrightarrow Na_2CO_3.10H_2O$$

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Manufacturing of Washing Soda (Solvay process) —

$$NaCl + H_2O + NH_3 + CO_2 \longrightarrow NaHCO_3 + NH_4Cl$$

Ammonical Brine solution | Carbon dioxide | Sodium Bi-carbonate | Ammonium chloride

$$2NaHCO_3 \xrightarrow{\Delta} Na_2CO_3 + H_2O + CO_2$$

$$Na_2CO_3 + 10H_2O \longrightarrow Na_2CO_3.10H_2O$$

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Uses of Washing Soda —

1. Sodium carbonate (washing soda) is used in glass, soap and paper industries.



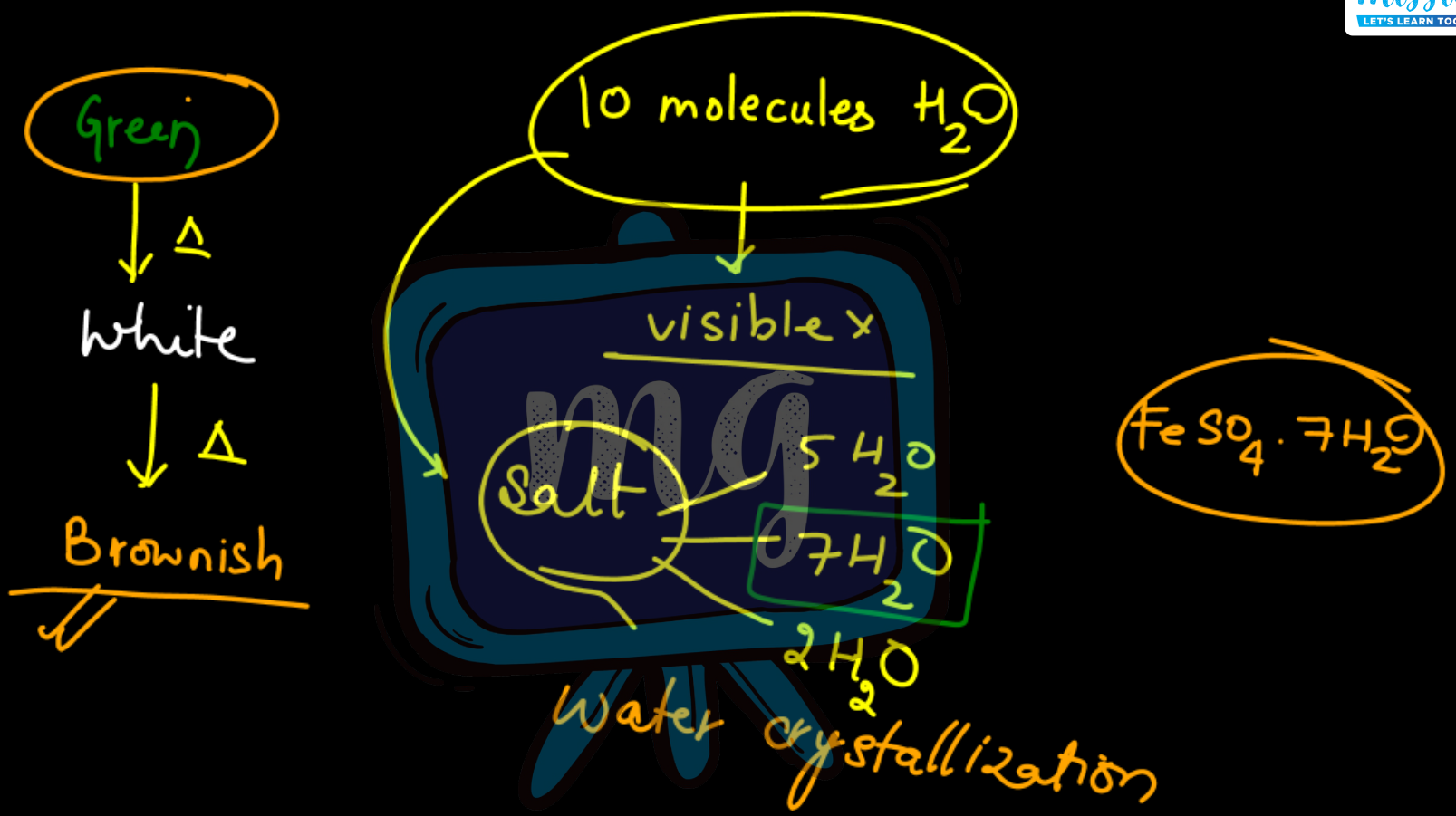
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2. It is used in the manufacture of sodium compounds such as borax.
3. Sodium carbonate can be used as a cleaning agent for domestic purposes.
4. It is used for removing permanent hardness of water.

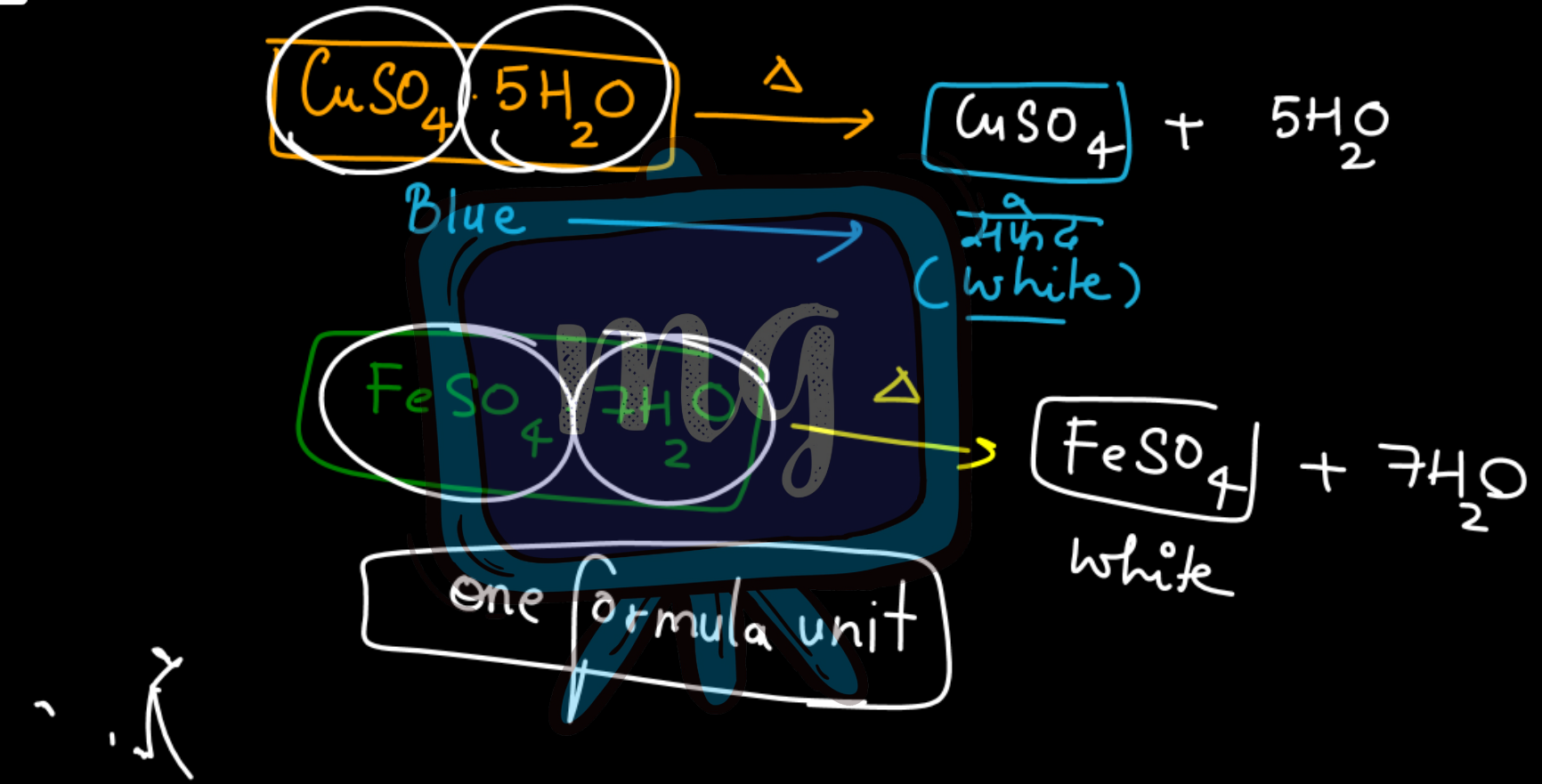
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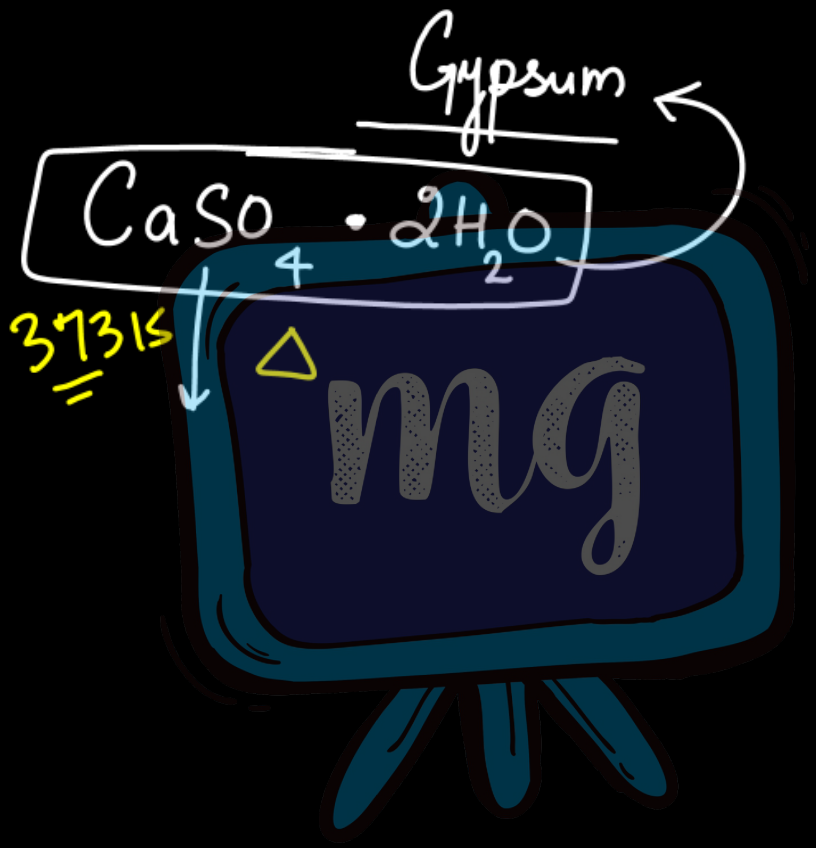
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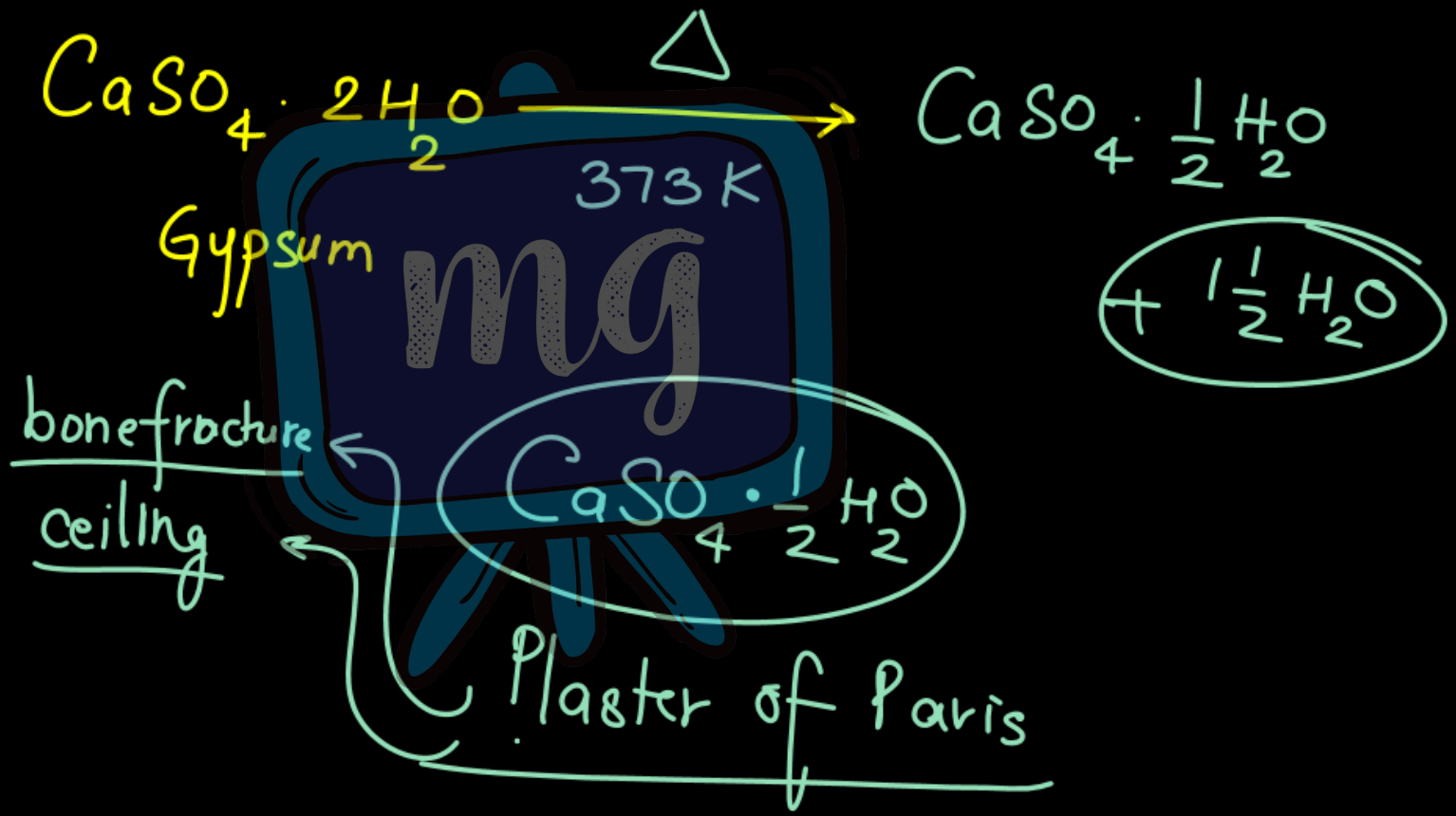
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6. Plaster of Paris ($CaSO_4.\frac{1}{2}H_2O$)—

- Calcium sulphate hemihydrate.

$$CaSO_4 \cdot 2H_2O \xrightarrow[\Delta]{373K} CaSO_4 \cdot \frac{1}{2}H_2O + 1\frac{1}{2}H_2O$$

Gypsum

Plaster of Paris (POP)



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Uses of Plaster of Paris —

1. Used as plaster for supporting fractured bones.
2. Making toys, decorative items.
3. Used for coating walls and ceilings.



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4. To prevent fire accident.
5. Use to make moulds of teeth to be replaced.



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Water of crystallization —

- Fixed number of water molecules present in one formula unit of a salt.

Hydrated copper sulphate –	$CuSO_4.5H_2O$.
Washing soda –	$Na_2CO_3.10H_2O$
Ferrous sulphate –	$FeSO_4.7H_2O$
POP →	$CaSO_4.\frac{1}{2}H_2O$
Gypsum →	$CaSO_4.2H_2O$

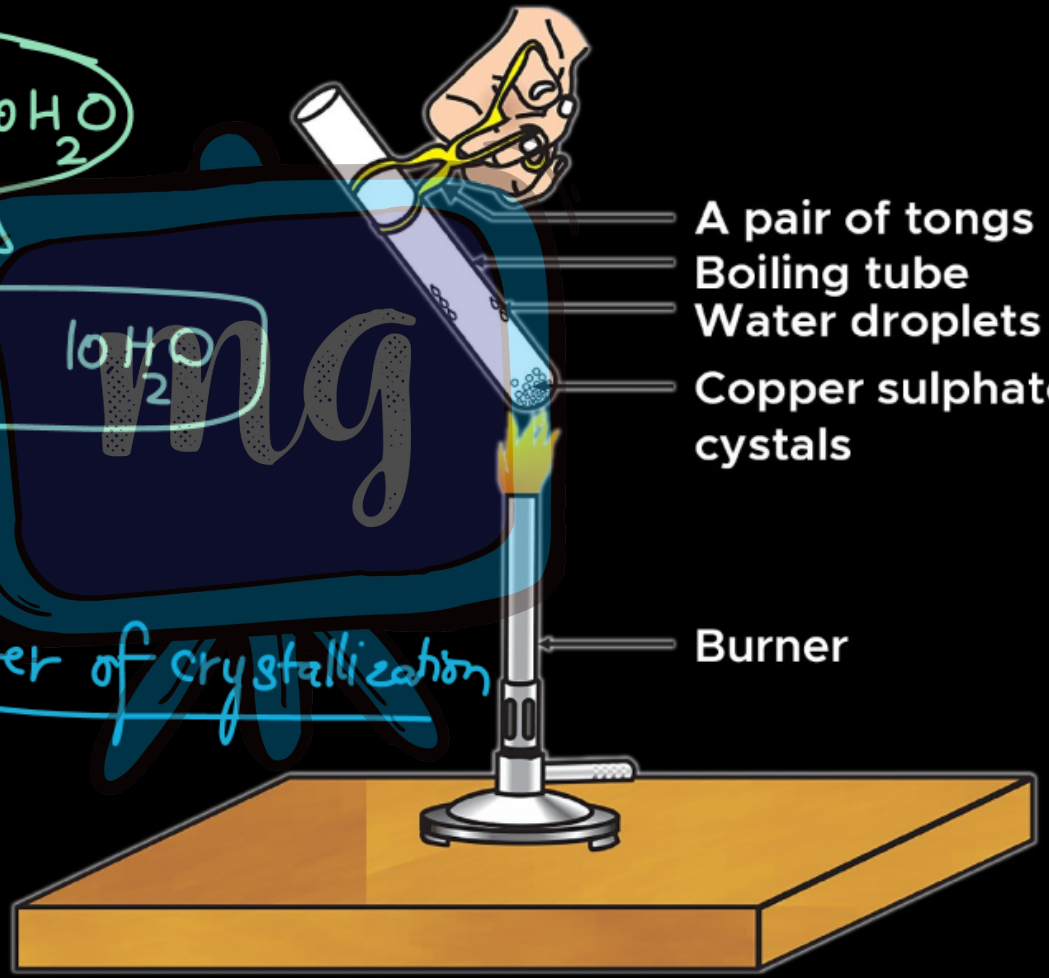
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$Na_2CO_3 \cdot 10H_2O \xrightarrow{\Delta}$

$n\left[Na_2CO_3 + 10H_2O\right]$

→ Water of crystallization



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Water of Crystallization



1) Salt → colour

2) powder → crystal form

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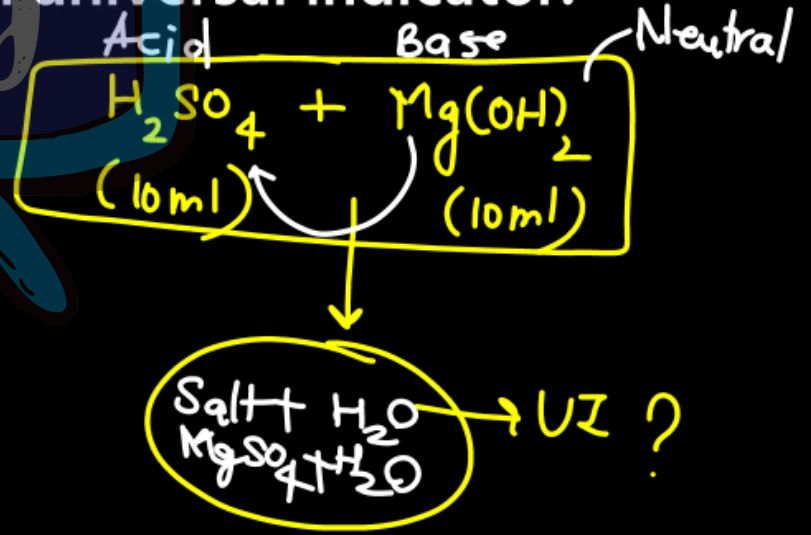
If 10 mL of H_2SO_4 is mixed with 10 mL of $Mg(OH)_2$ of the same concentration, the resultant solution will give the following colour with universal indicator:

(A) Red

(B) Yellow

(C) Green

(D) Blue



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A visually challenged student, has to perform a lab test to detect the presence of acid in a given solution. The acid-base indicator preferred by him will be:

(A) blue litmus ✗

(B) clove oil ✓ — olfactory indicator

(C) red cabbage extract

(D) hibiscus extract

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Which of the following oxide(s) is/are soluble in water to form alkalies?

(I) $Na_2O + H_2O$

(II) $SO_2 + H_2O \rightarrow H_2SO_4$

(III) $K_2O + H_2O$

(IV) NO_2

(A) (I) and (III)

(B) (I) only

(C) (II) and (IV)

(D) (III) only

alkali

Bases soluble in H_2O

NaOH

KOH

KOH

N

Na

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How can it be proved that the water of crystallisation makes a difference in the state and colour of the compounds?

$CuSO_4 \cdot 5H_2O \xrightarrow{\Delta} CuSO_4 + 5H_2O$

Blue → White

(a) Water of crystallization → Powder form / crystal form

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→ olfactory

→ B → R (Acid)

A cloth strip dipped in onion juice is used for testing a liquid 'X'. The liquid 'X' changes its odour. Which type of an indicator is onion juice? The liquid 'X' turns blue litmus red. List the observations the liquid 'X' will show on reacting with the following:

(A) Zinc granules + $HCl \rightarrow ZnCl_2 + H_2 \uparrow$

(B) Solid sodium carbonate

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