UDAAN

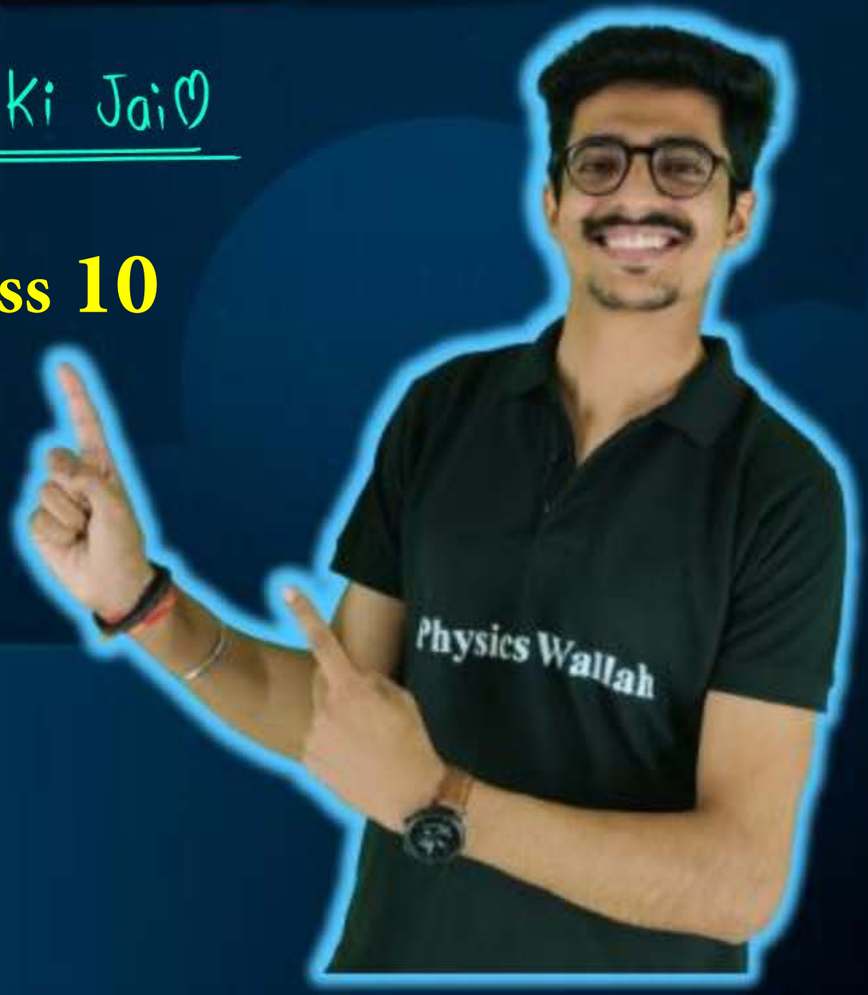
2025

Bharat Mata Ki Jai

ESSENTIAL CHEMISTRY BASICS for Class 10

MASTER BASICS OF CHEMISTRY – III

CHEMISTRY | Lecture – 03



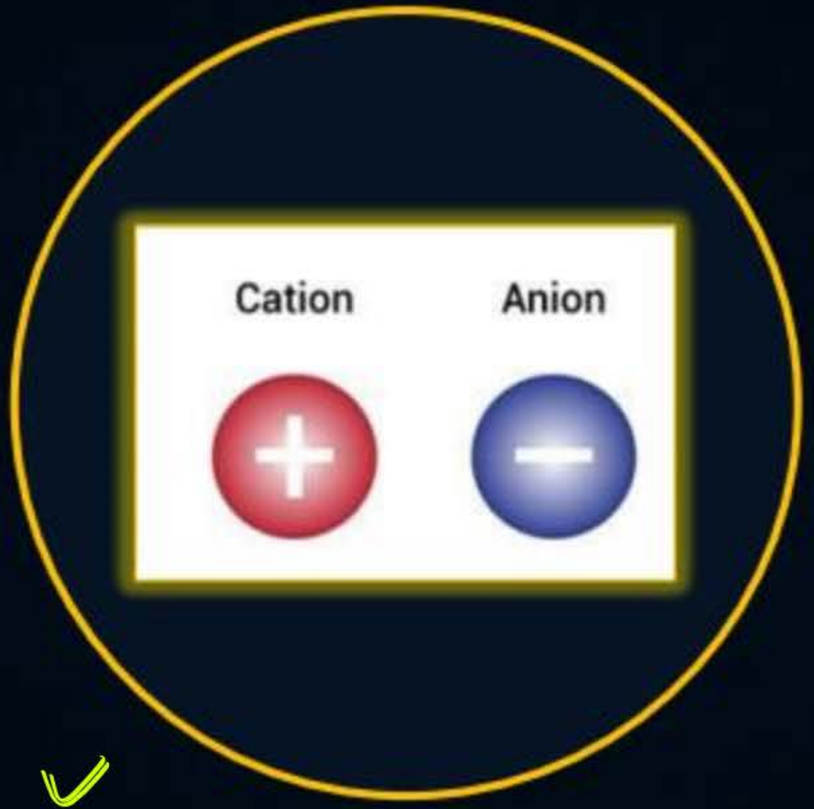
BY: SUNIL BHAIYA

Topics

to be covered

1. Ions and Their Types
2. Sunil Bhaiya's FON Trick
3. Writing Chemical Formula

Knowledge Ride On

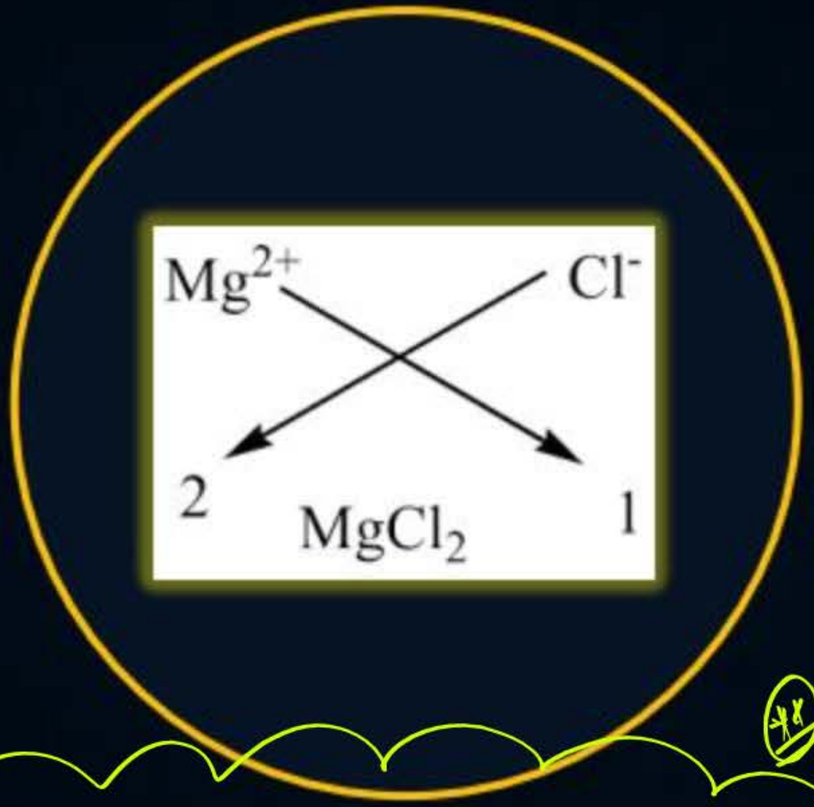


Ions and Their Types

Knowledge Ride On

Sunil Bhaiya's FON Trick

Knowledge Ride On



Writing Chemical Formula

Knowledge Ride On

Insaniyat Ka Gyaan

RIDDLE WALLAH

Warm-up

FILL IN THE BLANK!

Hasmukhlal: Hey!

Simaila: Hi BrO !

Hasmukhlal: <*Blocked Simaila*>

Br → Bromine

(I) A.No.(Z): 35

(II) Only non-metal found in liquid state at room temp. (अहोलिंग)

Hint: Blank contains a word formed by the chemical symbols of two non-metals. First non-metal of the word has atomic number 35 and it is the only non-metal found in liquid state at room temperature while second non-metal has atomic number 8.

(25 °C)

Hg → Mercury

Only metal found in liquid state at room temp.

Oxygen (O)

BrO

Sundar Balaks Be Like:

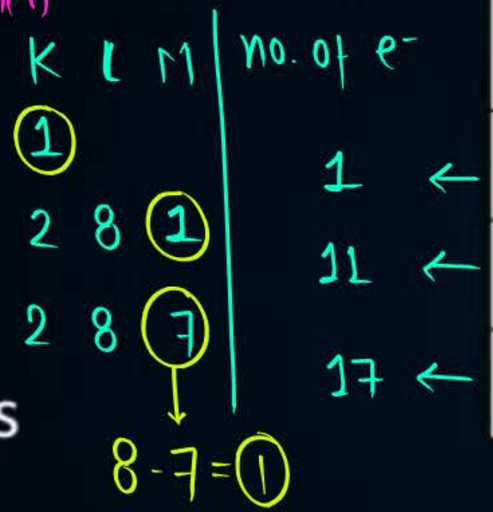
THE BOYS

Concept Polish (गृहकार्य) - Discussion

QUESTION

Elements with valency 1 are:

(तत्व) संयोजकता



Element	Metal/Non-metal	Valency
Hydrogen (H)	Non-metal (अधातु)	1
Sodium (Na)	Metal (धातु)	1
Chlorine (Cl)	Non-metal (अधातु)	1

A always metals

B always metalloids

C either metals or non-metals

D always non-metals

Ions and Their Types

Ions and Their Types

Atom (परमाणु) → electrically neutral (no overall charge)

↓

no. of protons = no. of electrons

An atom or a group of atoms that contains an overall electrical charge. → due to imbalance in number of protons & electrons

(I) Classification of ion on basis of type of charge

Cation (धनायन)

↓

+vely charged

Element has LOST electron(s)

No. of protons > electrons

Anion (ऋणायन)

↓

-vely charged

Element has GAINED electron(s)

No. of protons < electrons

Is the class lagging?

A. Yes

B. No

Please watch the recorded lecture!

Example of Ions

Representation of Ion: $X^{\pm Z}$ → charge; Z → numerical value; X → chemical symbol of atom / group of atoms

Sodium (Na)

7 electrons gain

K	L	M
2	8	1

Atomic Number	11
Number of Protons	11
Number of Electrons	11

1 electron lose → attain configuration similar to nearest noble gas → Neon (Ne)

Na^{1+}

$+11 - 10 = +1$

Sodium cation (Na^{1+})

K	L
2	8

Atomic Number	11
Number of Protons	11
Number of Electrons	10

In case of Cl^{1-}, is the number of electrons > number of protons?

A. Yes

B. No

Element	A.No. (Z)	no. of electron(s)	K	L	M
Cl	17	17	2	8	7

7 electrons lose

1 electron gain

Cl^{1-}	17	18	2, 8, 8

It tells that no. of electrons is 1 more than no. of protons.

Classification → Type II

Ions – On Basis of Number of Overall Charge

Monovalent Cation → Cu^{1+}, Na^{1+}, K^{1+}, NH_4^{1+} etc.
- one
- +ve charge

Divalent Cation → Mg^{2+}, Ca^{2+}, Cu^{2+}, Fe^{2+} etc.
- two

Trivalent Cation → Fe^{3+}, Al^{3+} etc.
- three
- +ve charge

Monovalent Anion → Cl^{1-}, HCO_3^{1-}, F^{1-} etc.
- one
- -ve charge

Divalent Anion → O^{2-}, SO_4^{2-}, S^{2-} etc.
- two

Trivalent Anion → PO_4^{3-}, N^{3-} etc.
- three
- -ve charge

Classification - III

Ions – On Basis of Number of Atoms in an Ion

(i) Monoatomic Ion

- one
- atom
- overall charge

(ii) Polyatomic Ion

- two or more than two (atom)
- overall charge

ex: Na^{1+}, Cu^{1+}, Cu^{2+}, Cl^{1-}, F^{1-}, K^{1+}, O^{2-} etc.

Polyatomic ions	Symbol
Ammonium →	NH_4^{1+}
Hydroxide →	OH^{1-}
Nitrate →	NO_3^{1-}
Hydrogen carbonate →	HCO_3^{1-}
Carbonate →	CO_3^{2-}
Sulphate →	SO_4^{2-}
Phosphate →	PO_4^{3-}

KYA BOLTI PUBLIC

aye bhaiya

Let's Practice

PW Ka ChemStar!

QUESTION

A cation is formed when _____.

(धनायन)

A number of electrons = number of protons

B number of electrons > number of protons

C number of electrons < number of protons

D number of neutrons = number of electrons

QUESTION

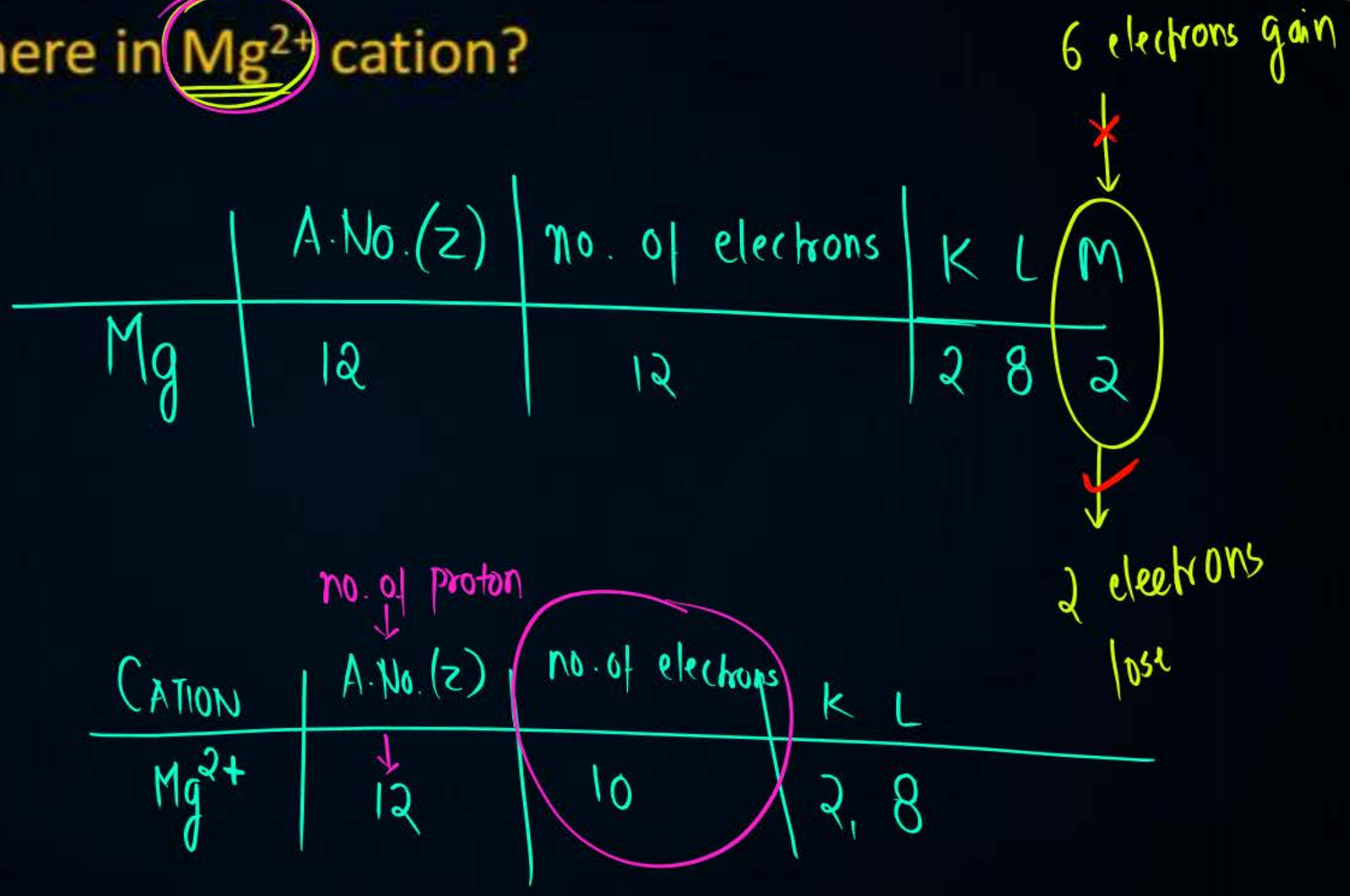
How many electrons are there in Mg^{2+} cation?

A. 9 electrons

B. 10 electrons

C. 11 electrons

D. 12 electrons



Sunil Bhaiya's FON Trick

① Optional Trick

② Works only on mentioned polyatomic ion

Trick to Calculate Overall Charge

Polyatomic ions	Symbol
Ammonium	NH_4^+
Hydroxide	OH^-
Nitrate	NO_3^-
Hydrogen carbonate	HCO_3^-
Carbonate	CO_3^{2-}
Sulphate	SO_4^{2-}
Phosphate	PO_4^{3-}

Do you find remembering their overall charges difficult?

Now, calculate them using Sunil Bhaiya's FON trick.

Sunil Bhaiya's FON Trick

Give F, O and N as -1, -2 and -3 charge and other atoms' positive charge equivalent to the valence electrons they have.

ex: (i) $OH^{(x)}$ (Hydroxide ion)

H | K 1

$\Rightarrow -2 + 1$

$\Rightarrow -1$

OH^{1-}

(ii) Carbonate ion CO_3^{x}

C | K 2 | L 4

$+4 \quad 3(-2)$

$+4 - 6$

$-2 \rightarrow CO_3^{2-}$

(iii) Hydrogen carbonate / Bicarbonate $\rightarrow HCO_3^{x}$

$+1 \quad +4 \quad 3(-2)$

$+5 - 6 = -1$

HCO_3^{1-}

Sunil Bhaiya's FON Trick

(IV) → Nitrate $[NO_3^{x-}]$

Priority order of giving -ve charge → F > O > N

	K	L
N	2	5

NO_3^{x-}

+5 3(-2)

+5 -6

-1 → NO_3^{1-}

(V) Phosphate → $[PO_4^{x-}]$

+5 4(-2)

+5 - 8

-3

PO_4^{3-}

	K	L	M
P	2	8	5

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Writing Chemical Formulae

Compound (यौगिक) → it is made from different elements, i.e. different types of atoms.

Ex:

Common Name

(i) Water

Chemical Name → Dihydrogen monoxide

	K	L
H	1	
O	2	6 → 8 − 6 = 2
N	2	5 → 8 − 5 = 3

(ii) Ammonia → Common name

Chemical name: → Nitrogen trihydride

Chemical Symbol: H O

Valency: 1 2

H_2O_1 or H_2O

Chemical symbol: N H

Valency: 3 1

NH_3

(iii) Magnesium chloride

Cl^{1-}

Charge: 1−

Valency: 1

Chemical Symbol: Mg Cl

Valency: 2 1

$MgCl_2$

(iv) Calcium oxide

O^{2-}

Charge: 2−

Valency: 2

Chemical symbol: Ca O

Valency : 2 2

CaO

(v) Sodium sulphate

SO_4^{2-}

charge: 2−

Valency: 2

Chemical symbol: Na SO_4

Valency: 1 2

Na_2SO_4

(vi) Potassium nitrate

NO_3^{1-}

charge: 1−

Valency: 1

Chemical symbol: K NO_3

Valency: 1 1

KNO_3

(vii) Calcium hydroxide

OH^{1-}

Charge: 1−

Valency: 1

Chemical Symbol: Ca OH

Valency: 2 1

$Ca(OH)_2$

(viii) Ammonium hydroxide

NH_4^{1+}

Charge: 1+

valency: 1

Chemical Symbol: NH_4 OH

Valency: 1 1

NH_4OH

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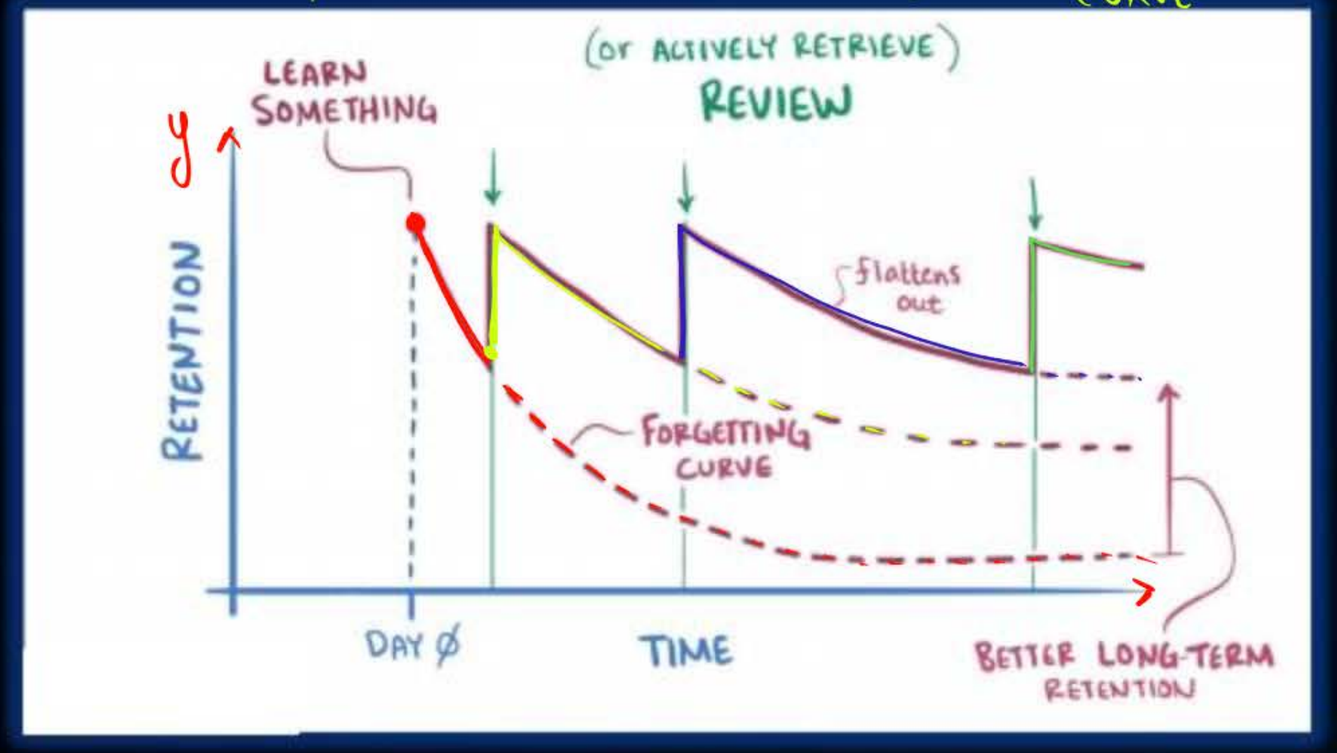
Concept Polish (गृहकार्य)

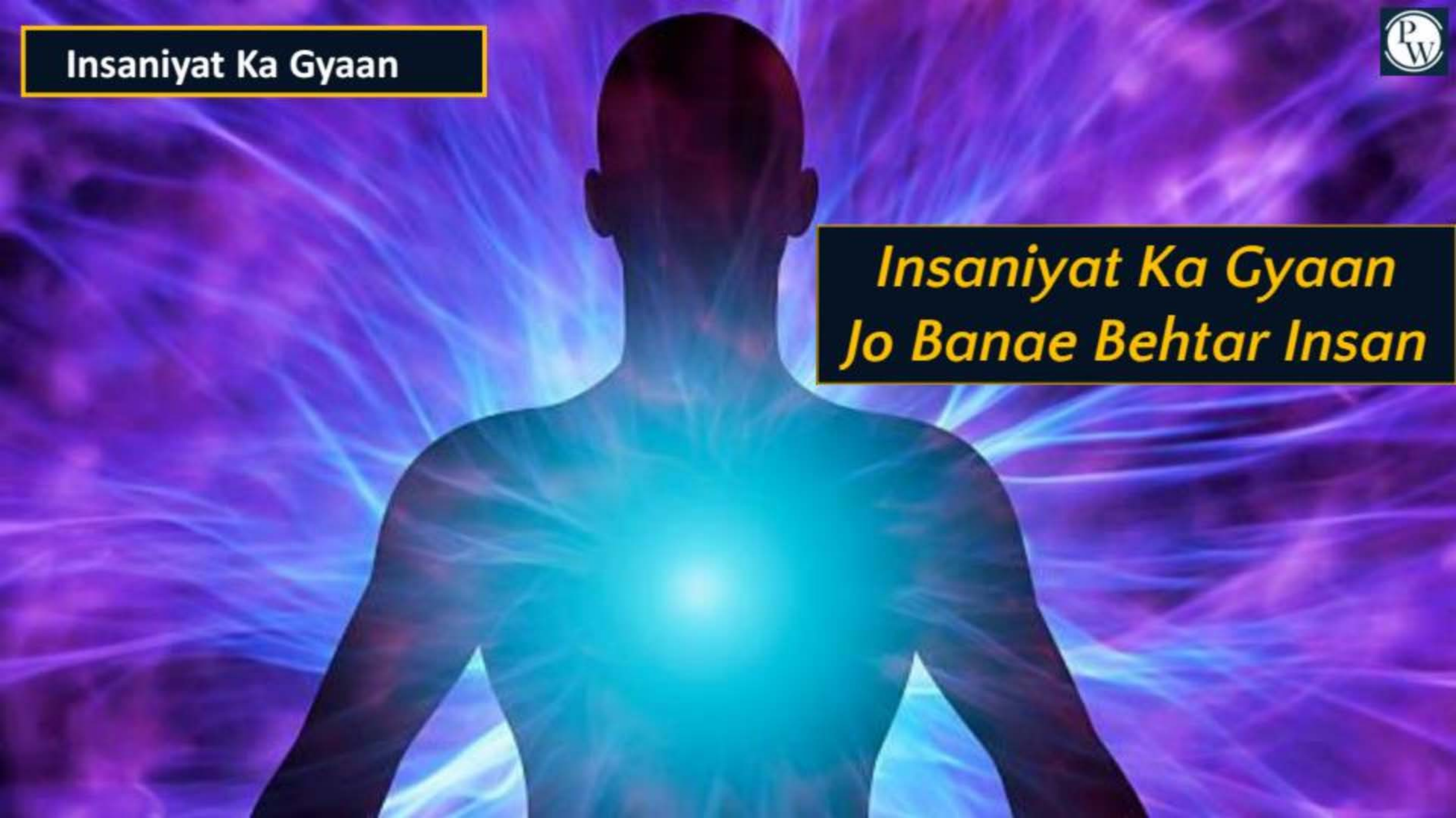
QUESTION

An element M forms the oxide MO. What will be the formula of its phosphate?

EFFICIENCY HACKS BY SUNIL BHAIYA

Importance of Revision Through FORGETTING CURVE




Insaniyat Ka Gyaan
Insaniyat Ka Gyaan
Jo Banae Behtar Insan

SUNIL BHAIYA IS ALWAYS THERE FOR YOU.

#sbsathhai

#pwsathhai

THANK YOU