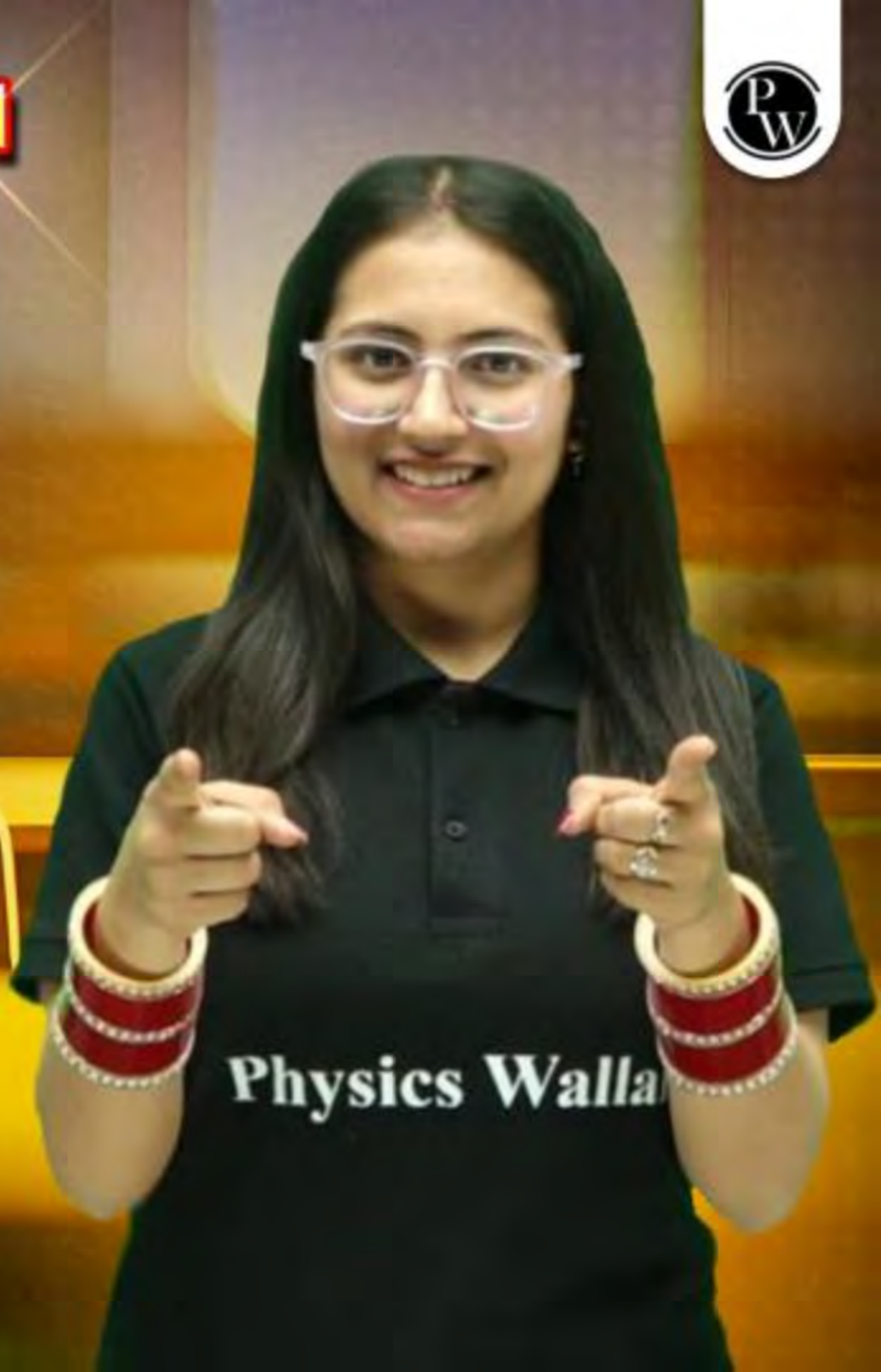
RADIANT 2026

Chemistry

The Language of Chemistry

Lecture-03

By- Bharti Ma'am



Topics *to be covered*

1. Chemical Name
2. Name of diff. Compounds
3. Calculating valency from chemical name
4. Que | KBC
5) More about Ions || Writing Chemical Formulae

Basic Radicals

Monovalent (umpositive)		Divalent (Dipositive)	
Potassium	K^+	Calcium	Ca^{2+}
Sodium	Na^+	Magnesium	Mg^{2+}
Cuprous	Cu^+	Barium	Ba^{2+}
Mercurous	Hg^+	Ferrous	Fe^{2+}
Hydrogen	H^+	Cupric	Cu^{2+}
Silver	Ag^+	Plumbous	Pb^{2+}
Ammonium	NH_4^+	Manganese	Mn^{2+}
		Zinc	Zn^{2+}
		Nickel	Ni^{2+}
		Stannous	Sn^{2+}
		Mercuric	Hg^{2+}

Trivalent (tripositive)		Tetravalent (tetrapositive)	
Ferric	Fe^{3+}	Stannic	Sn^{4+}
Aluminum	Al^{3+}	Plumbic	Pb^{4+}
Chromium	Cr^{2+}	Platinum	Pt^{4+}
Antimony	Sb^{3+}		

Acidic Radicals

Monovalent (Uninegative)		Divalent (Dinegative)	
Fluoride	F^-	Sulphate	SO_4^{2-}
Chloride	Cl^-	Sulphite	SO_3^{2-}
Bromide	Br^-	Sulphide	S^{2-}
Iodide	I^-	Carbonate	CO_3^{2-}
Hydride	H^-	Oxide	O^{2-}
Hydroxide	OH^-	Peroxide	O_2^{2-}
Bicarbonate	HCO_3^-	Thiosulphate	$S_2O_3^{2-}$
Bisulphate	HSO_4^-	Zincate	ZnO_2^{2-}
Bisulphite	HSO_3^-	Stannate	SnO_3^{2-}
Bisulphide	HS^-	Plumbite	PbO_2^{2-}
Hypochlorite	ClO^-	Manganate	MnO_4^{2-}

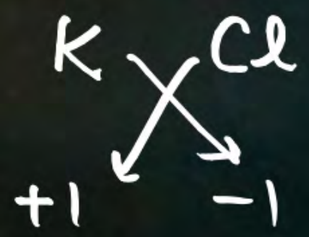
Monovalent (Uninegative)		Divalent (Dinegative)	
Chlorate	ClO_3^-	Chromate	CrO_4^{2-}
Perchlorate	ClO_4^-	Dichromate	$Cr_2O_7^{2-}$
Nitrate	NO_3^-	Oxalate	$C_2O_4^{2-}$
Nitrite	NO_2^-	Silicate	SiO_3^-
Permanganate	MnO_4^-	Acetylide	C_2^{2-}
Acetate	CH_3COO^-		
Cyanide	CN^-		
Aluminate	AlO_2^-		

Trivalent and Tetravalent

	Trivalent (Trinegative)		Tetravalent (Tetranegative)	
(i)	Nitride	N^{3-}	Methanide	C^{4-}
(ii)	Phosphate	PO_4^{3-}	Ferrocyanide	$[Fe(CN)_6]^{4-}$
(iii)	Phosphite	PO_3^{3-}		
(iv)	Phosphide	P^{3-}		
(v)	Ferricyanide	$[Fe(CN)_6]^{3-}$		

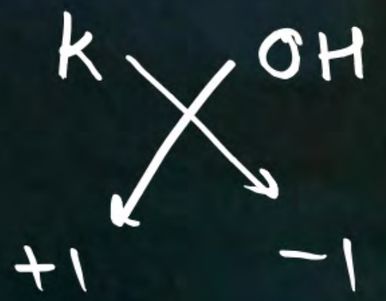
Chemical Formula

1. **Potassium chloride**



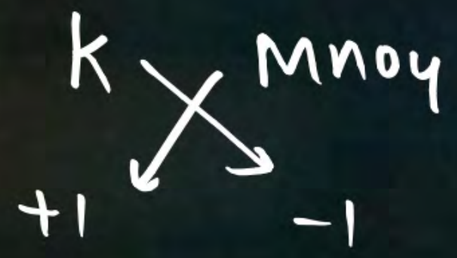
KCl

2. **Potassium hydroxide**



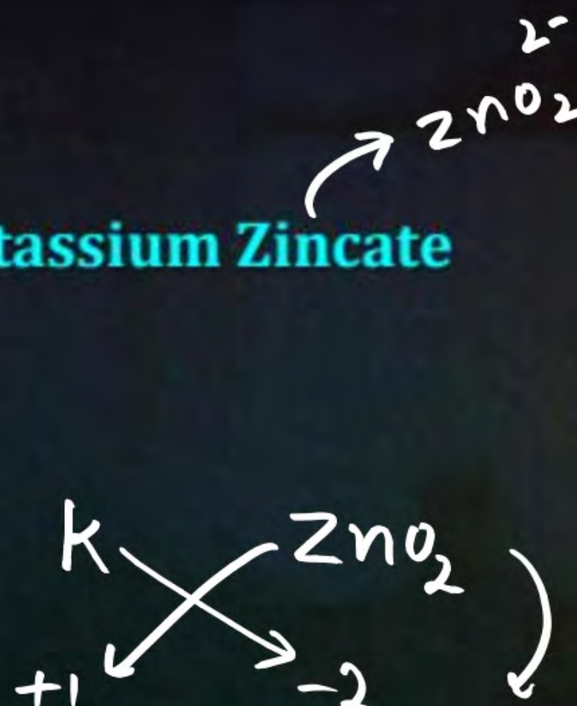
KOH

3. **Potassium permanganate**



$KMnO_4$

4. **Potassium Zincate**

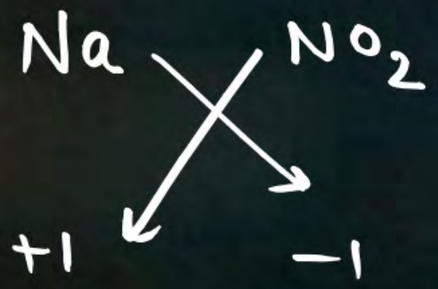


K_2ZnO_2

Nitrate :- NO_3^-

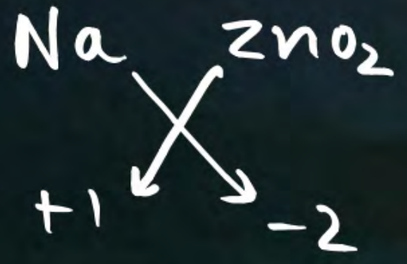
NO_2^-

5. **Sodium nitrite**



$NaNO_2$

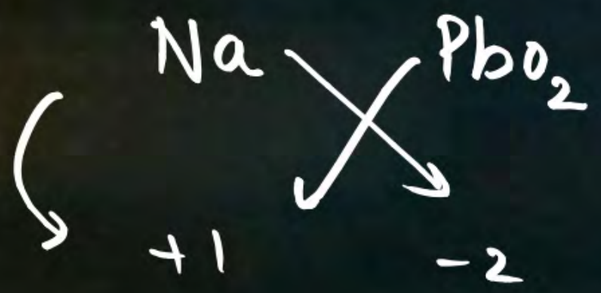
6. **Sodium zincate**



Na_2ZnO_2

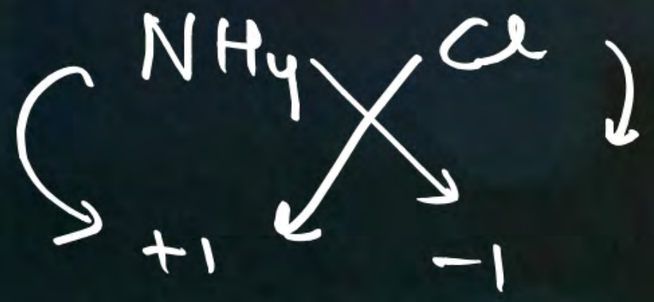
PbO_2^{2-}

7. **Sodium plumbite**



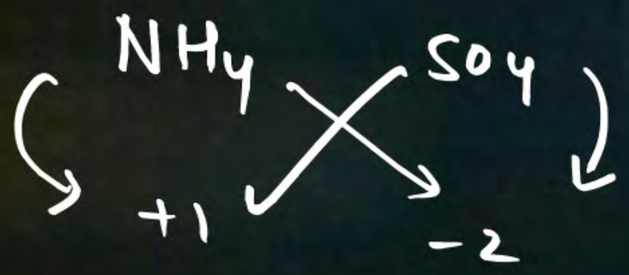
Na_2PbO_2

8. **Ammonium chloride**



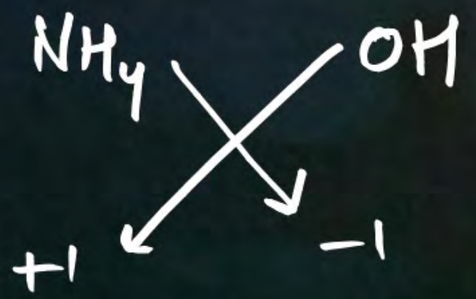
NH_4Cl

9. **Ammonium sulphate**



$(NH_4)_2SO_4$

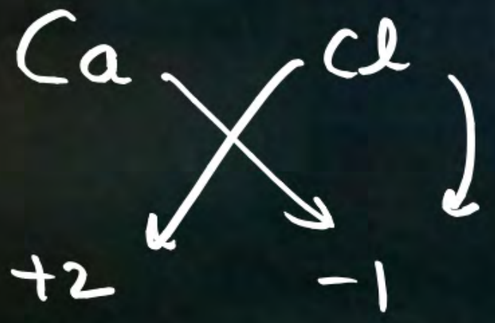
10. **Ammonium hydroxide**



NH_4OH

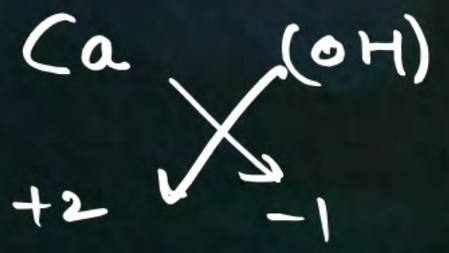
Ca^{+2} $\bar{O}H$

11. Calcium chloride



$CaCl_2$

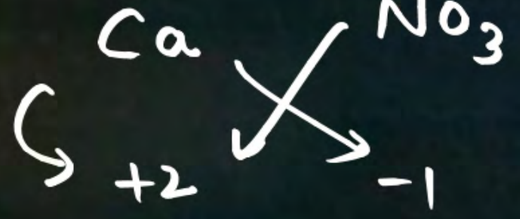
12. Calcium hydroxide



$Ca(OH)_2$

$\nearrow NO_3^{-1}$

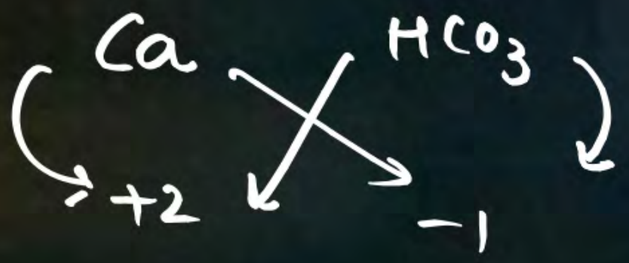
13. Calcium nitrate



$Ca(NO_3)_2$

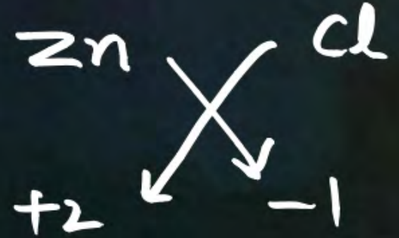
Bicarbonate
OR

14. Calcium hydrogen carbonate



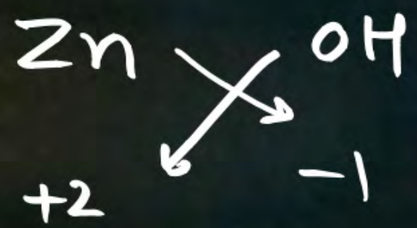
$Ca(HCO_3)_2$

15. Zinc chloride



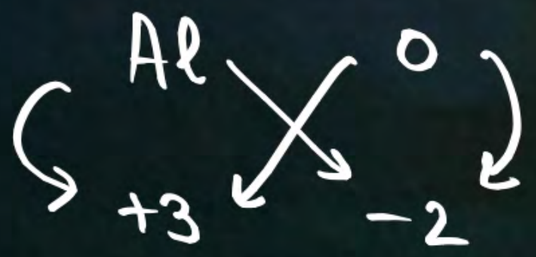
$ZnCl_2$

16. **Zinc hydroxide**



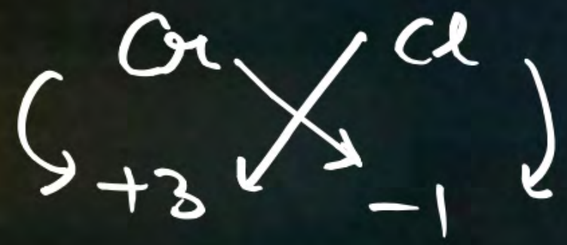
$Zn(OH)_2$

17. **Aluminium oxide**



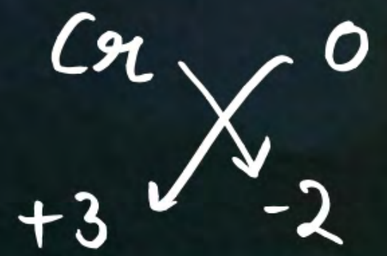
Al_2O_3

18. Chromium chloride



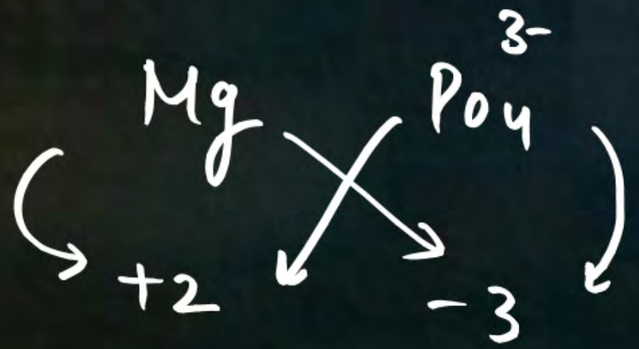
$CrCl_3$

19. Chromium oxide



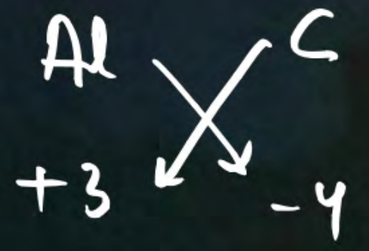
Cr_2O_3

20. Magnesium phosphate



$Mg_3(PO_4)_2$

21. Aluminium carbide

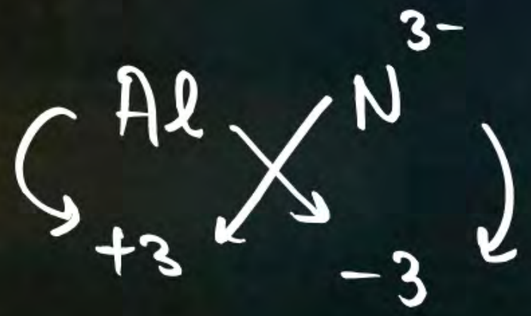


Al_4C_3

↳ No oxy.

22. **Aluminium nitride**

Imp



AlN

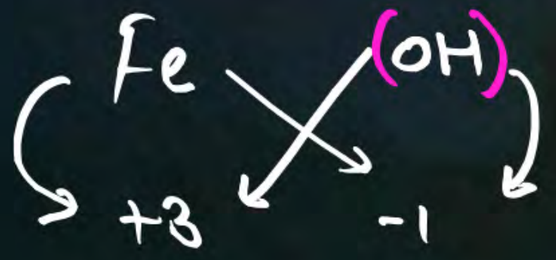
Fe^{+3}

Polyatomic ⇐ Ion :- ( )

23. **Ferric hydroxide**

Fe = 1
O = 1
H = 3
} X

$FeOH_3$

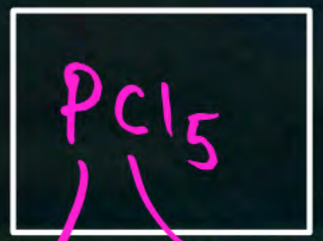


$Fe(OH)_3$

Naming Certain Compounds

1. **Two non-metals:** The prefix *tri* or *tetra* or *penta*, etc. is added, to the second non-metal.

For example, PCl_3 is phosphorus trichloride and PCl_5 is phosphorus pentachloride.



2. **Two elements and oxygen:** The name of the compound depends or the number of oxygen atoms present in the compound.

The prefix '*hypo*' is used if the number of oxygen atoms is less than 2.
NaClO – Sodium hypochlorite

The suffix '*ite*' is used if the number of oxygen atoms is 2.
$NaClO_2$ – Sodium chlorite

Prefix = Hypo (less)
↓
(less than 2)

Suffix = ite

Suffix = ate (oxy atom = 3)

The suffix '*ate*' is used if the number of oxygen atoms is 3.

$NaClO_3$ – Sodium chlorate

The prefix *per* is used when the number of oxygen atoms is more than 3.

$NaClO_4$ – Sodium perchlorate

oxy atom = 4 ✓

↓

'Prefix = per'

3. Naming of acids:

(a) Names of binary acids are given by adding the prefix 'hydro' and the suffix 'ic' to the name of the second element.

Examples:

(i) HCl is hydrochloric acid

(ii) HF is hydrofluoric acid

4. Names of acids containing radicals of polyatomic groups are given on the basis of the second element present in the molecule, and the prefix 'hydro' is not used.

Examples:

(i) In H_2SO_4, the second element is sulphur, hence the name sulphuric acid.

(ii) In HNO_3, the second element is nitrogen, hence the name nitric acid.

(iii) In H_3PO_4, the second element is phosphorus, hence the name phosphoric acid.

If the number of oxygen atoms is less, then suffix *'ous'* is used instead of *'ic'*. Thus H_2SO_3 is sulphurous acid, HNO_2 is nitrous acid.

5. Trivial names

There are certain compounds with names that do not follow any systematic rule. Such names called trivial or common names, and they are widely accepted.

1. **Marsh gas** CH_4
2. **Milk of magnesia** $Mg(OH)_2$
3. **Oleum** $H_2S_2O_8$
4. **Phosgene** $COCl_2$ (Carbonyl chloride)
5. **Plaster of Pairs** $CaSO_4 \cdot \frac{1}{2}H_2O$

1. **Potash alum** $K_2SO_4 \cdot Al_2(SO_4)_3^{24}H_2O$
2. **Quick silver** Hg
3. **Rock salt** $NaCl$
4. **Salt cake** Na_2SO_4
5. **Saltpetre** KNO_3

Determination of Valency from a formula

(i) Write the given formula

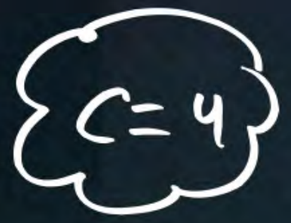
(ii) Interchange the subscripts present in the formula and write them on the top of the symbols of radicals, i.e., as superscripts.

(iii) Keeping in mind that the valencies of H, O and Cl and 1, 2 and 1 respectively, estimate the valency of the given element.

eg: CO_2

↓

$C^2 O^1$



↓

(Multiply Both by 2)

$C^{2\times2}$ $O^{1\times2}$

C^4 O^2

NO_2

↓

N^2 O^1

↓

Multiple Both side by 2

$N^{2\times2}$ $O^{1\times2}$

N^4 O^2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Chemoपुत्र
KAUN BANEGA

Question

What is the chemical formula for aluminium phosphate?

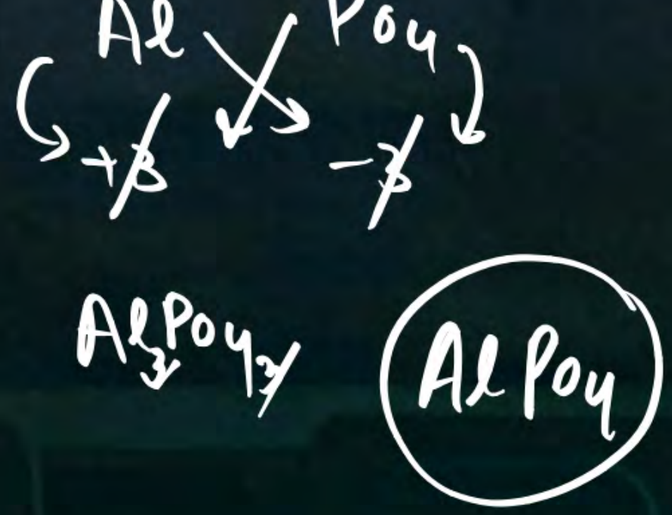
PO_4^{3-}

A $AlPO_4$

B $Al_3(PO_4)$

C $Al(PO_4)_3$

D $Al_3(PO_4)_2$



Question

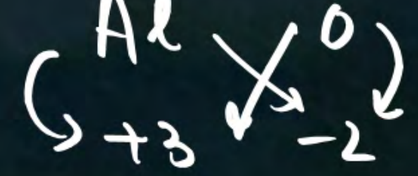
What is the chemical formula for aluminium oxide?

A Al_2O_3

B AlO

C Al_2O_2

D AlO_3



Al_2O_3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Thank You