



Nickel	Pentlandite	$(\text{Ni,Fe})_9\text{S}_8$	Coins, catalysts
Silver	Argentite	$\text{Ag}_2\text{S}$	Jewelry, mirrors
Gold	Native	-	Jewelry, electronics
Sodium	Rock salt, Cryolite	$\text{NaCl}$ , $\text{Na}_3\text{AlF}_6$	Preservative, chemicals
Calcium	Limestone, Gypsum	$\text{CaCO}_3$ , $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$	Cement, fertilizer
Magnesium	Magnesite, Dolomite	$\text{MgCO}_3$ , $\text{CaMg}(\text{CO}_3)_2$	Alloys, fireworks
Potassium	Carnallite, Sylvite	$\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$ , $\text{KCl}$	Fertilizers
Uranium	Pitchblende	$\text{U}_3\text{O}_8$	Nuclear fuel
Thorium	Monazite sand	$(\text{Ce,Th})\text{PO}_4$	Nuclear reactors
Tungsten	Wolframite	$(\text{Fe,Mn})\text{WO}_4$	Bulb filaments

### Important Metal Mining Areas in India

Metal / Ore	Major States / Areas	Key Fact / Note
Iron Ore	Odisha, Chhattisgarh, Jharkhand, Karnataka	India ranks 4th globally
Bauxite	Odisha, Jharkhand, Gujarat, Chhattisgarh	Odisha largest producer
Copper	Jharkhand, Madhya Pradesh, Rajasthan	Khetri – copper belt
Manganese	Madhya Pradesh, Maharashtra, Odisha	Used in steel making
Zinc & Lead	Rajasthan (Zawar, Dariba, Rampura-Agucha)	Largest in India
Gold	Karnataka (Kolar, Hutti), Jharkhand	Kolar Gold Fields
Chromite	Odisha (Sukinda Valley)	World's largest chromite deposit
Silver	Rajasthan, Jharkhand	By-product of lead & zinc
Mica	Jharkhand, Andhra Pradesh, Bihar	Electrical & cosmetic use
Limestone	Madhya Pradesh, Andhra Pradesh, Gujarat	Cement & steel
Uranium	Jharkhand (Jaduguda), Meghalaya	Nuclear fuel
Thorium	Kerala, Tamil Nadu, Andhra Pradesh	Largest monazite reserves

## Important Compounds and Their Uses

Compound Name	Chemical Formula	Use / Importance
Lime (Quicklime)	CaO	Cement, bleaching powder
Slaked Lime	Ca(OH) <sub>2</sub>	Whitewash, agriculture
Plaster of Paris	CaSO <sub>4</sub> ·½H <sub>2</sub> O	Casts, construction
Bleaching Powder	CaOCl <sub>2</sub>	Disinfectant, bleaching
Epsom Salt	MgSO <sub>4</sub> ·7H <sub>2</sub> O	Medicine
Blue Vitriol	CuSO <sub>4</sub> ·5H <sub>2</sub> O	Fungicide, lab reagent
Green Vitriol	FeSO <sub>4</sub> ·7H <sub>2</sub> O	Dyeing, fertilizers
White Lead	PbCO <sub>3</sub> ·Pb(OH) <sub>2</sub>	Paints
Red Lead	Pb <sub>3</sub> O <sub>4</sub>	Rust-proof paints
Potash Alum	KAl(SO <sub>4</sub> ) <sub>2</sub> ·12H <sub>2</sub> O	Water purification
Borax	Na <sub>2</sub> B <sub>4</sub> O <sub>7</sub> ·10H <sub>2</sub> O	Glass, detergents
Barytes	BaSO <sub>4</sub>	X-ray contrast medium
Cryolite	Na <sub>3</sub> AlF <sub>6</sub>	Aluminium extraction

## Key One-Liners for AFCAT / CDS

Fact / Question	Answer
Most abundant metal in Earth's crust	Aluminium
Most abundant element in Earth's crust	Oxygen
Metal found in liquid state at room temperature	Mercury (Hg)
Softest metal	Sodium (Na)
Hardest natural metal	Tungsten (W)
Lightest metal	Lithium (Li)
Heaviest natural element	Uranium (U)
Best conductor of electricity	Silver (Ag)
Second best conductor	Copper (Cu)
Most malleable and ductile	Gold (Au)
Non-metal conducting electricity	Graphite (C)
Amphoteric metals	Aluminium, Zinc, Lead, Tin
Alloy of Copper and Zinc	Brass
Alloy of Copper and Tin	Bronze
Alloy of Iron, Carbon, Chromium	Stainless Steel
Alloy of Nickel and Chromium	Nichrome
Ore of Aluminium	Bauxite

Ore of Iron	Hematite
Ore of Copper	Chalcopyrite
Ore of Lead	Galena
Ore of Zinc	Zinc blende
Ore of Tin	Cassiterite
Ore of Mercury	Cinnabar
Ore of Silver	Argentite

### ONE LINE APPROACH

- Down's process is useful in the extraction of which metal? — Sodium
- On reacting with ammonia, sodium forms which compound? — Sodamide
- Chemical name of edible soda. — Sodium bicarbonate
- Which salt is used in the production of water glass? — Glauber's salt
- Compound used in the manufacturing of submarines and purifying closed air. — Sodium peroxide
- Another name of sodium ammonium hydrogen phosphate. — Microcosmic salt
- Sodium metaphosphate used in removing hardness of water is known as? — Calgon
- Which element is present in chlorophyll? — Magnesium
- Metal used in flash light ribbon for photography. — Magnesium
- Base used in sugar production from molasses. — Calcium hydroxide
- Which carbonate is used in face cleaning powder? — Magnesium carbonate
- Sorel cement formula. —  $MgCl_2 \cdot 5MgO \cdot nH_2O$
- Chemical formula of feldspar. —  $K_2O \cdot Al_2O_3 \cdot 6SiO_2$
- $3Al_2O_3 \cdot 6SiO_2 \cdot 2H_2O$  is formula of which element? — Kaolin clay
- Alloy of Mg used in aircraft manufacturing. — Magnalium
- Catalyst used in gasoline production. — Nickel
- Which carbide is known as methanide? — Aluminium carbide
- Aluminium sulphate used in cloth dyeing is known as? — Hair salt
- Metal used to remove water from alcohol solution. — Calcium
- Common names of CaO and  $Ca(OH)_2$ . — Quick lime and Slaked lime
- Which salt of calcium is used as a dehydrating agent? —  $CaCl_2$
- Chemical name of gypsum and plaster of Paris. —  $CaSO_4 \cdot 2H_2O$  and  $CaSO_4 \cdot \frac{1}{2}H_2O$
- Compound used in oxy-acetylene flame for welding. — Calcium carbide ( $CaC_2$ )
- Compound used as  $H_2$  gas source. — Hydrolith
- $CaCN_2$  is a good nitrogenous fertilizer known as? — Nitrolim
- Manganese dioxide is mostly used in which type of cells? — Dry cells
- Amount of iron is maximum in which type? — Cast iron / Pig iron
- Steel is an alloy of which elements? — Fe and C
- Which type of steel used in rail track and bridge? — Medium steel (manganese steel)
- Invar is an alloy of steel used in watch manufacturing. — Nickel (36%)
- Steel used in making magnetic springs? — Tungsten steel
- Green salt form used in blue ink. — Mohr's salt
- Common name of hydrated ferrous sulphate. — Green vitriol
- Common name of iron sulphide. — Fool's gold
- Anaemia caused by deficiency of which element? — Iron

- Disease due to excess iron intake. — Siderosis
- German silver is alloy of which metals? — Cu, Zn, Ni
- Besides Cu, gold used with which metal? — Aluminium (Al)
- Dutch metal and Muntz metal are alloys of which? — Cu and Zn
- Alloy used in coins. — Cu and Ni (Cupro-nickel)
- Alloy used in ornaments for golden colour. — Cu, Sn, Zn
- Mixture of blue vitriol and slaked lime. — Bordeaux mixture
- Salt used in making ruby glass and dyes. —  $\text{Cu}_2\text{O}$
- White bronze contains excess amount of which metal? — Tin
- Compound used in photochromic glass. — Horn silver ( $\text{AgCl}$ )
- Chemical name of lunar caustic. — Silver nitrate ( $\text{AgNO}_3$ )
- Eggs should not be eaten by silver spoon due to formation of? — Silver sulphide
- Unit of measuring gold purity. — Carats
- Absolutely pure gold is of how many carats? — 24 carats
- Tip of pen nib made of which metal? — Platinum
- Compound used in lithopone white pigment. — Zinc sulphate + Barium sulphate
- Common use of zinc phosphide. — Rat poison
- Mixture of zinc sulphide and barium sulphate. — Lithophone
- Compound used in phosphorescent screens. — Zinc sulphide ( $\text{ZnS}$ )
- Zinc carbonate used in medicine for which disease? — Skin diseases
- Where is mercury kept? — In iron pot
- Metal used in industrial vermilion preparation. — Mercury
- Hg vapours and Ar gas used in? — Tubelights
- Lead oxide used in making of? — Flint glass
- Chocolate coloured powder used in lead industry. — Tetraethyl lead (TEL)
- An antiknocking agent. — Tetraethyl lead (TEL)
- Jaber mines of Rajasthan famous for? — Lead and Zinc
- Metal used as glow tube detector target. — Thorium
- Catalyst used in Haber's process. — Iron
- Metal used in atomic bomb production. — Plutonium
- Category including gold, platinum, silver, mercury. — Noble metals