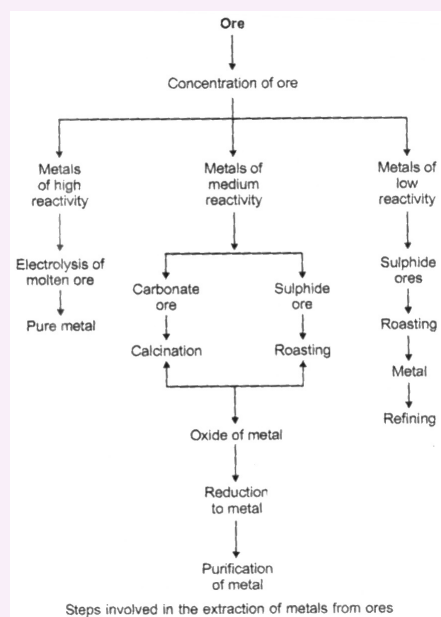


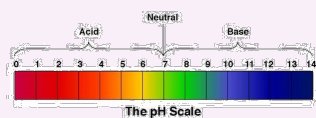
## indicators

INDICATOR	ACIDS	BASES
phenolphthalein	colourless	pink
methyl orange	red	yellow
red litmus	red	blue
blue litmus	red	blue

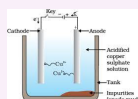
## extraction of metals



## ph



## refining of metals



## functional group

Hetero atom	Class of compounds	Formula of functional group
Cl/Br	Halo- (Chloro/bromo) alkane	-Cl/-Br (substitutes for hydrogen atom)
Oxygen	1. Alcohol	-OH
	2. Aldehyde	$\begin{matrix} \text{H} \\   \\ \text{C} \\    \\ \text{O} \end{matrix}$
	3. Ketone	$\begin{matrix} \text{C} \\    \\ \text{O} \end{matrix}$
	4. Carboxylic acid	$\begin{matrix} \text{O} \\   \\ \text{C} \\   \\ \text{OH} \end{matrix}$

## reactivity series

K	Potassium	<div style="display: flex; align-items: center; justify-content: center;"> <div style="width: 20px; height: 100px; background: linear-gradient(to bottom, orange, red, yellow, green, blue); margin-right: 5px;"></div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">           Most reactive                           Reactivity decreases                           Least reactive         </div> </div>
Na	Sodium	
Ca	Calcium	
Mg	Magnesium	
Al	Aluminium	
Zn	Zinc	
Fe	Iron	
Pb	Lead	
<b>H</b>	<b>Hydrogen</b>	
Cu	Copper	
Hg	Mercury	
Ag	Silver	
Au	Gold	

## alloy

ALLOY	COMPOSITION
brass	Cu + Zn
stainless steel	Fe + Ni + nickel, chromium
bronze	Cu + Sn copper, tin
solder	Pb + Sn lead, tin
amalgam	if any one is mercury

