

S	M	T	W	T	F	S	WK
30	31				1		1
2	3	4	5	6	7	8	2
9	10	11	12	13	14	15	3
16	17	18	19	20	21	22	4
23	24	25	26	27	28	29	5

General properties of first row transition metal compounds:

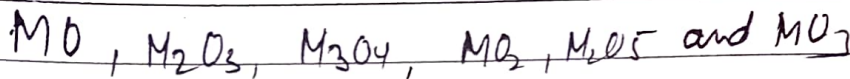
8

1. Oxides: The transition metals generally react with oxygen at high temp. to form oxides.

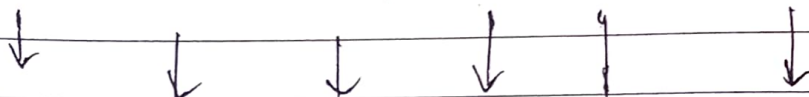
9

A large variety of oxides of different oxidation states are formed. The general formulae of the oxides are

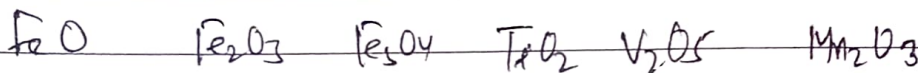
10



11



12



1

Elements Important oxides of first transition series

2



3

Sc		Sc ₂ O ₃ (b)			
Ti	TiO (b)	Ti ₂ O ₃ (b)	TiO ₂ (c)		
V	VO (b)	V ₂ O ₃ (b)	VO ₂ (c)	V ₂ O ₅ (a)	
Cr		Cr ₂ O ₃ (b)	CrO ₂ (c)		CrO ₃ (a) #
Mn	MnO (b)	Mn ₂ O ₃ (b)	Mn ₃ O ₄ (c)	MnO ₂ (c)	Mn ₂ O ₇ (a)
Fe	FeO (b)	Fe ₂ O ₃ (b)	Fe ₃ O ₄ (b)		
Co	CoO (b)				
Ni	NiO (b)				
Cu	Cu ₂ O (b)	CuO (b)			
Zn	ZnO (amphoteric)				

5

6

a = acidic

b = basic

c = amphoteric

FEBRUARY							11
WK	M	T	W	T	F	S	S
6		1	2	3	4	5	6
7	7	8	9	10	11	12	13
8	14	15	16	17	18	19	20
9	21	22	23	24	25	26	27
10	28						

JANUARY

TUESDAY

04

WK 2 004-301

When a transition metal

forms oxides in different oxidation states, then oxides with lower oxidation state are basic and higher oxidation states are acidic. Oxides with intermediate oxidation state are amphoteric.

eg. $+2$ $+3$ ~~$+5$~~ $+4$ $+7$
 MnO Mn_2O_3 ~~Mn_2O_5~~ MnO_2 Mn_2O_7
 basic basic ~~amphoteric~~ amphoteric acidic

ie. Basic nature of oxides of transition elements decreases with the increase in oxidation state and acidic nature increases with the increase in oxidation state.

Q. Which of the following oxides of Mn are the most basic

- (a) MnO (b) Mn_2O_7
 (c) Mn_2O_3 (d) Mn_2O_5

Basic nature $\propto \frac{1}{O.S.}$

Acidic nature $\propto O.S.$

Q. Which of the following oxides of Mn are the most acidic

- (a) MnO (c) MnO_2
 (b) Mn_2O_3 (d) ~~Mn_2O_7~~

Reducing character of oxides:

Reducing agents are oxidised i.e. they have tendency to lose electrons.