Day-28

→ Frenkel – AgCl

→ Schottky – NaCl

→ material + Higher order (even 1D) defect

→ Anion Frenkel – Anion sublattice

Eg: CaF → small anion
↓
large cation

$K_{AF} = [V_F^{\cdot}][F_i']$

→ CCP framework of Cl where Na occupies octahedral voids (Describing NaCl)

→ Cation and the anion from a surface site : interstitial position
eg: PbO (layered structure with lots of gap in between)

$K_{AS} = [Pb_i^{\cdot\cdot}][O_i^{\cdot\cdot}]$

→ F, S, AF, AS : unit ionic defect reactions

→ n number of V_{Ag}^{+} $(V_{Ag}' - V_{Ag}')$

defect cluster/ associated defects

$V_{Ag}' + Ag_i^{\cdot} \rightleftharpoons (V_{Ag}' - Ag_i^{\cdot})(V_{Ag}' - Ag_i^{\cdot})$ (K_{AF})

$Ag_{Ag} + V_i \rightleftharpoons V_{Ag}' + Ag_i^{\cdot}$

→ Band-to-Band :

e'_{CB} and $h^{\bullet}_{VB}$ | e^{x}_{VB} and h^{x}_{CB}

$K_B \propto \exp.\left(\frac{-E_g}{kT}\right)$

N_c, N_v → effective density of states

→ SnO_2 – Transparent conducting oxide in solar cell.

→ Acid-base reaction : No change of valence states.

(all ionic defect)