

## Effective atomic number (EAN)

Total number of  $e^-$  of CMA after accepting  $e^-$  pair from ligands.

$$EAN = Z - (O.S) + 2 \times C.H.$$

1.  $K_4[Fe(CN)_6] \Rightarrow 26 - (+2) + 2 \times 6 = 36 [Kr]$

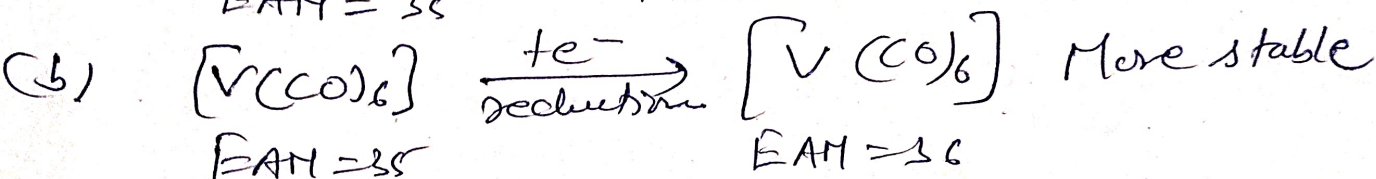
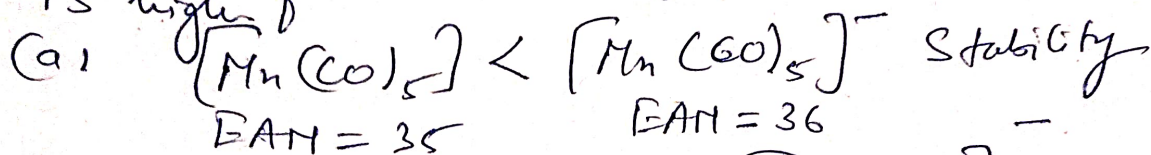
$$O.S = +2, C.H = 6$$

2.  $K_3[Fe(CN)_6] \Rightarrow 26 - (+3) + 2 \times 6 = 35$

3.  $[Fe(\eta^5-C_5H_5)_2] = 26 - (+2) + 2 \times 6 = 36 [Kr]$

## Sidgwick rule

$\rightarrow$  If EAN of CMA in metal carbonyl is equal to atomic number of nearest inert gas then the stability of metal is higher.



(c)  $[Fe(CO)_5] =$  neither oxidising nor reducing  
 $\rightarrow$  Sidgwick rule is applicable only for metal carbonyl

EAN of Polynuclear Metal carbonyl

