```
Engineering Chemistry
                               P. Sai Omech
         Home Arignment-03
10) A sample of cuater is found to contain the
 forceing dissolving sacts in milli grams per litre
 Mg(HCO3) 2 = 78, CaCl2 = 111, Ca(HCO3) = 81,
 Migsoy = 40, Nacl = 10, and Mgcl2 = 95. Calculate
 pemporary and permanent foundness and total
An) Given, Mg (HCO3) = 73,
           Call = 111, ca (HCO3) = 81, MgSOy=40,
            Nacl = 10, Mg Cf2= 95
  Houdness (mg/L ou Caco3) = Sout Concentration (mg/L)X
                              Molar mais of salt
  Temporary hardness (caused by (Mg (HCO3)) & Ca (HCO3)2)
    · Mg(4003) = 73mg/L
     Houdney as Caco3 = 78×100 = 50mg/L
    · Ca(HCO3), = 81mg/L
Franches of caco3 = 81×100 = 50mg/L
  Total temporary hardness = 50 +50 = 100 mg [L
  · Permanent houdness (coursed by Cach, MgCl, & Mgsoy):
     · Cacc = 111mg(L
      Houdners as Calog = 111 ×100 = 100mg/L
```

2100031754

(cont..)

\$100031754 . MgSOy = 40mg/L Hardners as Ca (03 = 40×100 = 33.33 mg/L . Mgcl = 95mg/L Hardner ar Caco3 = 95×100 = 100mg/L Total permint hardner = 100 + 33.33 + 100 1) most born under 2 233.33 mg/L Total hardnes = Temporary hardness of permanent 100+233.33 (100H) PM- (15V) 1 2 333.33 mg/L sa) corite a brief account on a) Caustic embrittlement b) boiles corrosson. Ans) a) Coustic embrittlement: It is a type of Corrorion that occurs in boiles due to concentration of caustic (solium hydroxide) in certain areai, leading to cracks. Merhanism: High temperatures caux sodicern car bonate to decompose into sodium hydroxide, with concentrates in crevites. This creates a highly alkaline environ ment, Cealing to embrittlement, and cracking of the metal.

· (à(12 = (1.4400))

Hardner as (à(03 = 414 x 100 = 400mg/L

(Contine)

b) Boiler Corrosion: Boiles corrosion is the degrad--ation of boiles material due to the reaction with dissolved oxygen, carbon dioxide, and other acidic compounds in water. Mechanism: Dissolved oneggen realts with metal, forming iron oxide (rust), while coubon dioxide formi carbonic acid, further accelerating corrosion, Prevention: Removal of oxygen by deaevation, use of oxygen scavengers like sodicum suefite, and maintaing proper pH lèveli in boiled watel. seftime and carribe Herogenia principality HEUET respond they present my Hiller chaired Effer with Connac be remetiled, Recyclofiund con be meetted. or represent one let in wastering a fracts of salesdorenships who is examples. chloride (pro), see across measures. sassitto diol cleunical nu cien, Officerion to the land. contenier, cultivines, model Supersion ... Principlante are moldaple and rechtope of a their lences of wrong, achile themse sen, wire time