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Assignment No 1 Revised

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Two basic design parameter of wastewater treatment system are Hydraulic Retention time (HRT) and solid detention Time (SRT)

Q1 Briefly describe each one these parameters.

Ans

Hydraulic retention Time (HRT):-

The hydraulic retention time or L(tau) is a measure of average length of time that is soluable compound remains in a constructed bioreactor. The volume of the aeration tank divided by the influent flowrate is T (tau) the hydraulic retention time.

⇒ IMPORTANT OF HYDRULIC RETENTION TIME:-

The Hydraulic retention time is closely related to the amount of substrat that can be handled per unit time, thereby has a direct impact on the economic feasibility of a bioprocess. A short HRT yields a higher hydrogen production rate and lowers capital outlay by reducing the size of the bioreactor

Effect of hydraulic retention time and media of constructed wetland for treatment of domestic waste water:-

A green house experiment was conducted to investigate the effect of varing soil-to-sand ratio of constructed wetland on wastewater treating efficiency. wetland bed were prepared with locally available plant, specifically cattail. Treatment efficency was evaluated for parameters such as BOD5, COD, SS, TKN and TP. The result indicated that the nutrient reduction corresponds to alonger retention time in wetland beds. Under the longest hydraulic retention time (HRT) of 3day, the system with media containing soil-to-sand ratio of 75:25 illusted the highest removal efficencies of BOD5, COD SS, TKN and TP by 92±5, 91±6% 76±9, 90±3 and 95±3% respectively. The infiltration rate was also decreased after operation particularly in the treatment with lower sand content. However, the highest growth rate of cattail was found under the shortest HRT (0.75 day) condition.

Q2 What are method use for decoupling SRT from HRT?

Ans: By decoupling the SRT and the HRT, the liquid wastewater can be processed faster ItRT is the time three stirring method can be used in this system

-> mechanical stirring
-> biogas recycling
-> and treated wastewater recycling.

The hydraulic retention time SRT from HRT Reduces the capital Expenditure and increase Biogas production and for CHP untidization. The decoupling of SRT from from HRT not only increase glucoce at organic loading rate of 6.5 - 42.8 g COP/L-d and HRT 8-12 hour The solid retention time (SRT) to 99.9% in the IBRoss from 0.55 - 1.8 in CSTRs To 2.4-9.6 %/L-d SRT from HRT to Ensure Sufficient reactor biomass

Q3 Advantage of decoupling SRT from HRT :-

① Good contact b/w biomass and substrate efficiency.
② Required small area.
③ State sludge
④ long service time
⑤ simpling design.
⑥ Relatively low cost
⑦ Low Excess sludge production