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Section:- C

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Q1:- Briefly describe each one of these parameters?

⇒ Hydraulic Retention time:-

HRT define as the ratio between the reactor volume and feed flow rate, represents the average time the cells and substrates stay inside the reactor. HRT is very important parameter for hydrogen and methane production in continuous mode very low HRT compares the washout of the reactor. Which means all the active microorganisms escape out from the reactor. On the contrary an adequate HRT result in abundant hydrogen and methane yields. HRT favored the washout of methanogens, guaranteeing the survival of hydrogen producers.

⇒ Solid Retention time:-

The Solid Retention time (SRT) is the time the solid fraction of the wastewater spend in a treatment unit. It is quality of solid maintained in the reactor divided by the quantity of solid coming out of the reactor each day. $SRT = V \times cd / Q_{out} \times c_{out}$. c_{out} is the solid concentration of the effluent.

In a conventional, completely mixed or plug flow reactor, the HRT equals the SRT.

The Solids retention time or SRT controls the bacteria through the treatment system.

- * Smaller reactor ~~system~~ size.
- * Larger separator size.
- * Reduced sludge production.

(2)

Q2 What are the methods used for decoupling SRT from HRT.

Ans:-

By decoupling the SRT and HRT, the liquid wastewater can be processed faster. HRT is the time water is retained within the digester and is equal to reactor volume divided by the average volumetric flowrate. In many instances a short HRT will reduce capital operation cost. There may be some advantages for simple design generally reliable and easily managed. Although modern controls permits it hands off management of more complex design that decouple HRT and SRT.

Some of the more common digester types are given below.

- * Continuous stirred tank reactor.
- * HRT Contract Reactor.
- * HRT sequencing Batch reactor.
- * Plug flow reactor.
- * Induced bed reactor.