

MECHANISM OF AEROBIC AND ANAEROBIC SLUDGE DIGESTION WITH MERITS AND DEMERITS:

Sludge digestion is a biochemical phenomenon involving organisms, enzymes, food and environment. The principal objective of sludge digestion is to subject the organic matter present in the settled sludge of the primary and final sedimentation tanks to anaerobic or aerobic decomposition so as to make it amenable to dewatering on sand beds or mechanical filter before final disposal on land, lagoon or sea. Sludge digestion brings about reduction in volume. While anaerobic digestion of sludge produces gas which can be utilized wherever feasible, aerobic digestion does not produce any utilizable by product other than well stabilized sludge.

Anaerobic digestion is the biological decomposition of organic matter in absence of oxygen. It consists of two distinct stages

First stage (Acid fermentation)

Second stage (Methane fermentation)

Advantages

- a. Lower BOD concentration in digester supernatant
- b. Production of odourless and easily dewaterable biologically stable digested sludge.
- c. Recovery of more basic fertilizer value in digested sludge.
- d. Lower capital cost
- e. Fewer operational problems

Disadvantages

- a. Higher power costs generate higher operating costs comparable with anaerobic digestion
- b. Gravity thickening process following aerobic digestion and to generate high solids concentration in the supernatant
- c. Some aerobically digested sledges do not dewater easily in vacuum filtration
- d. No methane gas is produced for recovery as a byproduct.