IV EXPERIMENT INVESTICATION

4.1 Experiment Apparatus

A laboratory-scale activated Sludge tank in the experimental study was made of acrylic plastic. Both aeration and settling parts were in the same tank but were separated by a common sliding baffle. It's dimension was shown in figure 4.1 Volume of an aeration and a settling chamber were 12.6 litre and 3.96 litre respectively.

The wastewater was stored in the 20 litre feed bottle and stirred continuously by a moter - driven peddle. Sigma motor pump fed 10 litre/day of the wastewater from the bottle into an aeration tank continuously. A 40 litre/minute air compresser was to supply air in the aeration tank. The air was filtered by water. Treated wastewater was discharged into effluent bottle from where samples were collected for laboratory investigation.

Schematic diagram of the activated sludge and the feeding system were shown in Figure 4.2

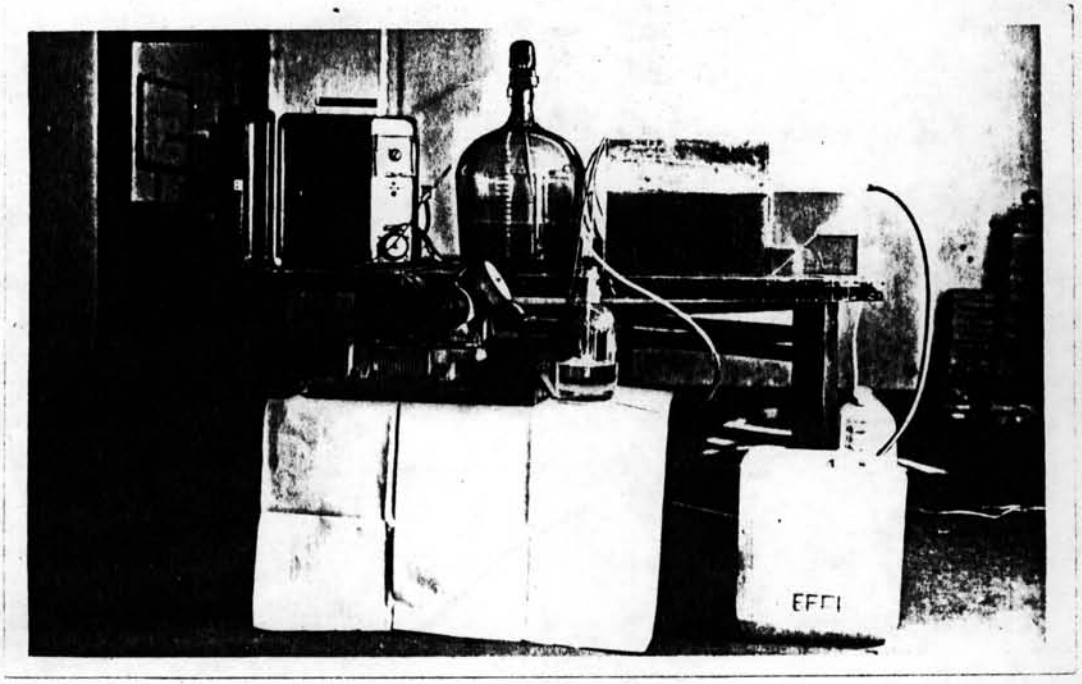


Fig. 4.1 General View of the Experimental Set-up

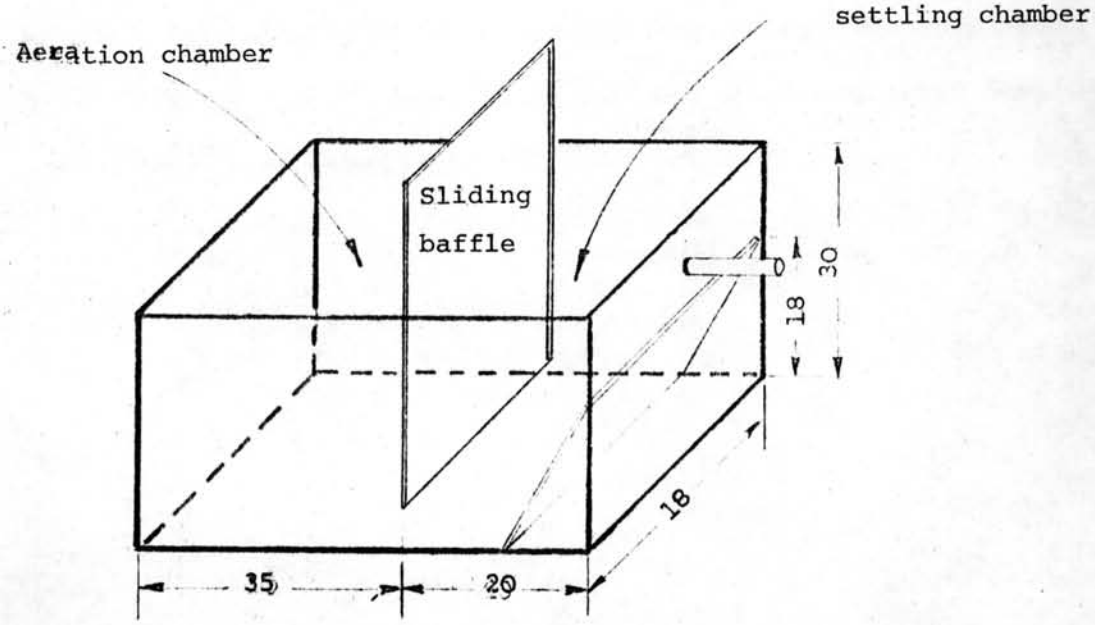
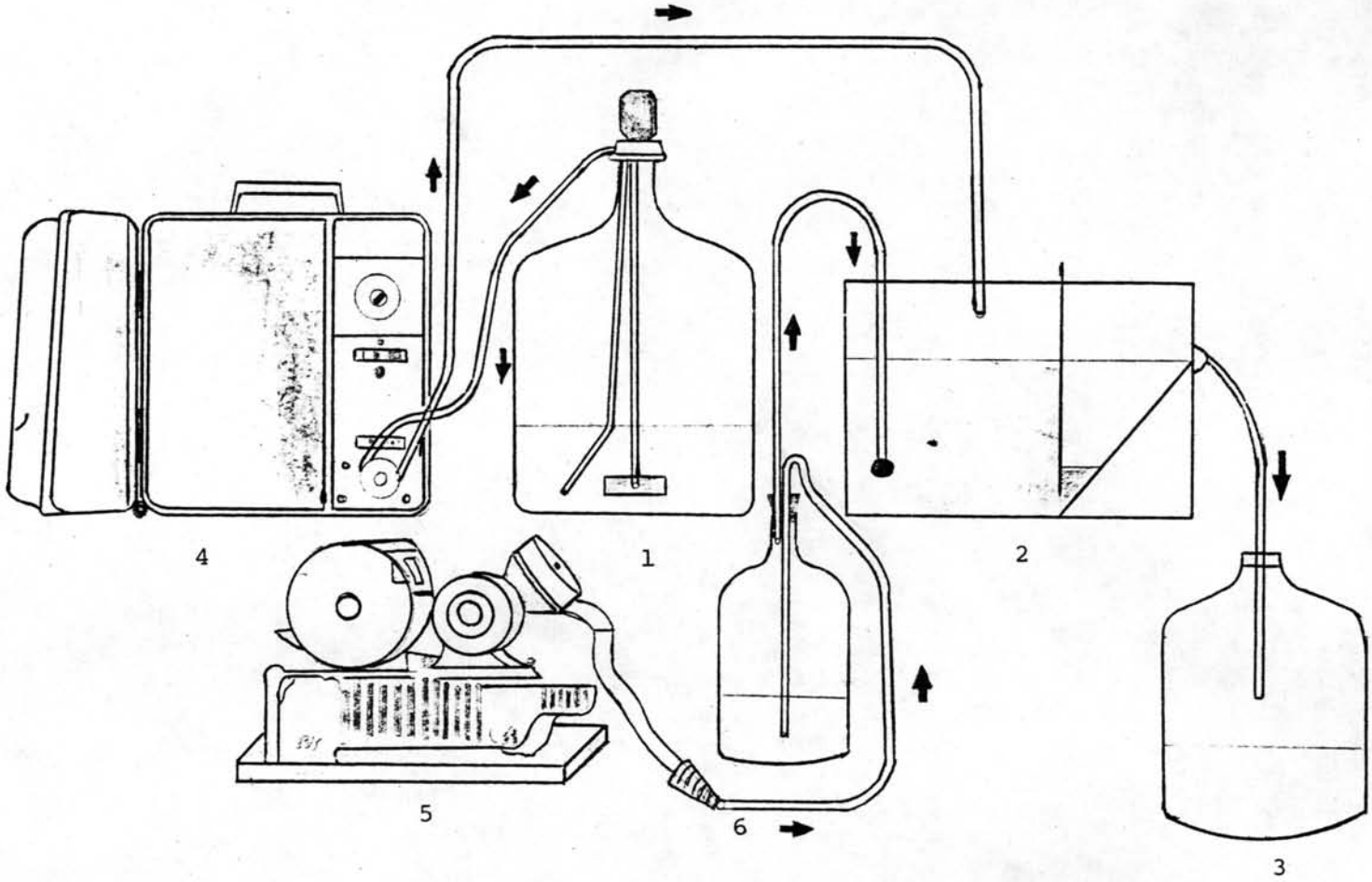


Figure 4.2 Laboratory-scale activated sludge tank



1 Raw wastewater bottle

2 Aeration and settling tank

3 Effluent bottle

4 Sigma motor pump

5 Blower

6 Air filter

Figure 4.3 Continuously - operated Activated Sludge

4.2 Wastewater Used in the Study

Concentrated synthetic wastewater was prepared by blending 150 grams of short bodied markerel (ปลาทู) (Rastrelliger negleclus (Van Kampen) meat with 400 ml. of water. A series of BOD and COD determinations revealed that 150 ml. of the concentrate diluted to one litre of distrilled water would produce a mixture with BOD about 7,900 mg/l and COD about 10,500 mg/l.

Table 4.1 Characteristics of Raw Fish Cannery Wastewater and Synthetic Wastewater

	Raw Wastewater	Synthetic Wastewater
BOD	4,400 - 5,000	4,400
COD	6,170 - 8,000	6,440
pH	6.5 - 7.0	6.2 - 6.7
Temperature	26° - 29°c	24° - 29°c
Ammonia Nitrogen	482	557
Organic Nitrogen	160	89
Phosphate phosphorus	88	33
Suspended Solids	600 - 700	1,750
Total Solids	6,500 - 7,500	3,960
Chloride	1,200 - 1,500	250
Grease	180 - 200	7

Table 4.1 showed the characteristics of the synthetic wastewater compared with raw wastewater from SAPCOL (THAILAND) FISH CANNING FACTORY. The BOD of synthetic wastewater was equal to the lower value of the actual BOD range.

4.3 Experiment Program

The experimental study was designed to evaluate performance of the activated sludge process in treating fish cannery wastewater. The design criteria of this system: F/M ratio, solid retention time (SRT), and some necessary coefficients were studied.

The process performance was assessed in term of percent BOD and COD removal. The settleable solids and SVI determined at various F/M ratio loading to evaluate the loading level at which the best sludge settling occured. The effects of pH and nutrients on the process efficiency were also investigated.

In this experiment F/M ratio varied from 0.2 to 1.2 lbs BOD/day/lb MLVSS. BOD loading and/or mixed liquor solids in the aeration tank were manipulated in order to shift from one ratio to another.

The continuous flow through system were maintained until steady condition prevailed. Concentrations of suspended solids in the tank was measured daily. Constnat level of suspended solids was maintained by wasting solid at the rate equal to the

buildup.

For four to five times during each steady state samples were collected and analysed.

The pH in the reactor was kept in a range of 6.8 to 7.2 by using K_2HPO_4 and KH_2PO_4 solution. The experiment were conducted at room temperature in the range of 24° to 29°c.

4.4 Sampling and Analysis

During steady states of each F/M ratio samples were collected four to five times.

To assure that the steady states had been reached BOD, COD and MLSS concentration were examined periodically, and pH, DO, temperature were monitored daily.

Recommended analytical techniques in the standard Methods (1974) were used.