introduced from the SU tank into the P tank, in the U phase the activated sludge is again mixed with the water, in the V phase the activated sludge is sedimented, and in the A phase treated water is drawn off, wherein in the SU tanks the cycles are phase-shifted in relation to one another, the A phases border one another, a flow passes through the SU tanks merely in the A phases, an approximately constant water level is provided and therefore a wastewater treatment system discharge corresponding to the wastewater treatment system supply develops ("continuous flow" principle), and, wherein the volume of the P tank is mixed permanently or intermittently.

In order to save space and costs, the bio-P is applied in the special waste water treatment plants described in claim 1 of the present invention. The additional constructional costs for the implementation of the P tank, which include e.g. a wall between the P tank and the B tank, a pipe for the transport of the thickened sludge from the SU tank into the P tank, and a mixing system for mixing the volume of the P tank, are moderate compared to the costs for a phosphor precipitation.

The P tank produces in the same way an equalization of the concentrations of the waste water in the B tank and increases the dry concentration of the activated sludge in the B tank. This increase results in a necessary complete volume of the treatment system, which volume will be nearly equally large with or without the P tank.

In the S phase the thickened activated sludge flows from the SU tank into the P tank preferably by means of a pipe or a conduit connecting the SU tank with the P tank.

In one arrangement of the tanks, when the SU tanks are arranged side by side on one side of the B tank, the P tank is arranged on a side of the B tank opposite of the side where the SU tanks are arranged (see Fig. 2).

In another arrangement of the tanks, when the SU tanks are arranged on opposite sides of the B tank, the P tank is arranged in the middle of the B tank (see Fig. 4). This arrangement is useful with regard to wastewater purification by large waste water treatment plants with many modules. In order to mix the rude waste water in the P tank efficiently with the sludge, the P tank is preferably constructed in the form of a circulation tank. Circulation tanks that may be used in the present invention are well known to those skilled in the art and typically comprise a horizontal partition wall, around which the waste water is kept in a horizontal

CLAIMS

1. A method for carrying out biological purification of wastewater with the aid of activated sludge, the method comprising:

providing an activated sludge tank that can be ventilated (the B tank),

providing a number of sedimentation and recirculation tanks (the SU tanks), which are continuously connected hydraulically to the B tank and in which a number of operating cycles are carried out over the course of a day, the operating cycles including a sludge return phase (the S phase), a recirculation phase (the U phase), a pre-sedimentation phase (the V phase) and a draw-off phase (the A phase),

providing a tank for biological phosphorus elimination (the P tank), wherein the P tank is hydraulically connected with the B tank via one or more openings,

wherein the wastewater is first introduced into the P tank, in which the volume of the P tank is mixed permanently or intermittently with activated sludge and phosphorus is eliminated from the wastewater, and then the wastewater is subsequently transferred from the P tank into the B tank, and then from the B tank, in alternation, into the SU tanks,

wherein consecutively, in the S phase at least part of a thickened activated sludge is introduced from the SU tank into the P tank, in the U phase the activated sludge is again mixed with the wastewater, in the V phase the activated sludge is sedimented, and in the A phase treated water is drawn off,

wherein in the SU tanks the cycles are phase-shifted in relation to one another, the A phases are temporally adjacent to one another, a flow passes through the SU tanks only in the A phases, an approximately constant water level is provided and therefore a wastewater treatment system discharge corresponding to the wastewater treatment system supply develops (“continuous flow” principle),

wherein, when the SU tanks are arranged side by side on one side of the B tank, the P tank is arranged in one case on a side of the B tank opposite of the side where the SU tanks are arranged and in a second case between the SU tanks and the B tank, and, when the SU tanks are arranged on opposite sides of the B tank, the P tank is arranged in one case in the middle of the B tank and in a second case between the Su tanks and the B tank.

2. The method according to claim 1, characterized in that excess sludge is received by the P tank.

3. The method according to claim 1 or claim 2, characterized in that the activated sludge flows from the SU tanks into the P tank by means of a pipe connecting the SU tanks with the P tank.

4. The method according to any one of claims 1 to 3, characterized in that the width of the P tank is approximately L/6, with L being the width of the SU tanks.

5. The method according to claim 1, wherein, when the SU tanks are arranged on opposite sides of the B tank and the P tank is arranged in the middle of the B tank, the P tank is constructed in the form of a circulation tank.

6. The method according to claim 5, characterized in that the waste water and the thickened activated sludge in the P tank are mixed by producing a flow in longitudinal direction at the water level and a flow in opposite direction at the bottom of the P tank.