CLAIMS

[Claim 1]

A biological treatment method comprising passing organic wastewater from a manufacturing process of electronic devices sequentially through two or more biological treatment tanks arranged in series, wherein

at least two tanks of the two or more biological treatment tanks are aerobic biological treatment tanks,

one of the aerobic biological treatment tanks is a final-stage biological treatment tank,

a pH in at least one biological treatment tank other than the final-stage biological treatment tank is adjusted by adding an acid or an alkali, and

an addition amount of the acid or the alkali is controlled so that an M-alkalinity of a liquid in the final-stage biological treatment tank is maintained at not more than 50 mg/L as $CaCO_3$.

[Claim 2]

The biological treatment method according to Claim 1, wherein the addition amount of the acid or the alkali is controlled based on the M-alkalinity of the liquid in the final-stage biological treatment tank or an indicator correlated with the M-alkalinity.

[Claim 3]

The biological treatment method according to Claim 2,

wherein the indicator correlated with the M-alkalinity is the pH of the liquid in the biological treatment tank to which the acid or the alkali is added, and the addition amount of the acid or the alkali is controlled based on a correlation previously determined with respect to the M-alkalinity and the pH.

[Claim 4]

The biological treatment method according to any one of Claims 1 to 3, wherein the aerobic biological treatment tank(s) other than the final-stage biological treatment tank is a nitrification tank, and the pH in the nitrification tank is controlled to be not less than a prescribed value.

[Claim 5]

The biological treatment method according to any one of Claims 1 to 4, further comprising subjecting the treated water discharged from the final-stage biological treatment tank to one or more advanced treatment processes selected from coagulation separation, reverse osmosis membrane separation, and ion exchange treatment.

[Claim 6]

The biological treatment method according to Claim 5, further comprising recovering and reusing the water treated by the advanced treatment process.

[Claim 7]

A biological treatment apparatus comprising two or more

biological treatment tanks arranged in series through which organic wastewater from a process of manufacturing electronic devices is sequentially passed, wherein

at least two tanks of the two or more biological treatment tanks are aerobic biological treatment tanks,

one of the aerobic biological treatment tanks is a final-stage biological treatment tank,

at least one biological treatment tank other than the final-stage biological treatment tank has a pH adjusting unit that adjusts the pH by adding an acid or an alkali, and

the apparatus includes a controller for controlling an addition amount of the acid or the alkali by the pH adjusting unit so that an M-alkalinity of a liquid in the final-stage biological treatment tank is maintained at not more than 50 mg/L as $CaCO_3$.

[Claim 8]

The biological treatment apparatus according to Claim 7, wherein the controller controls the addition amount of the acid or the alkali by the pH adjusting unit based on the M-alkalinity of the liquid in the final-stage biological treatment tank or an indicator correlated with the M-alkalinity.

[Claim 9]

The biological treatment apparatus according to Claim 8, wherein the indicator correlated with the M-alkalinity is

the pH of the liquid in the biological treatment tank to which the acid or the alkali is added, and the controller controls the addition amount of the acid or the alkali by the pH adjusting unit based on a correlation previously determined with respect to the M-alkalinity and the pH.

[Claim 10]

The biological treatment apparatus according to any one of Claims 7 to 9, wherein the aerobic biological treatment tank(s) other than the final-stage biological treatment tank is a nitrification tank, and the apparatus includes a controller that controls the pH in the nitrification tank to be not less than a prescribed value.

[Claim 11]

The biological treatment apparatus according to any one of Claims 7 to 10, wherein the apparatus includes one or more advanced treatment units selected from a coagulation separation unit, a reverse osmosis membrane separation unit and an ion exchange treatment unit so that the advanced treatment unit treats treated water discharged from the final-stage biological treatment tank.

[Claim 12]

The biological treatment apparatus according to Claim 11, wherein the apparatus includes a recovery unit that recovers the treated water from the advanced treatment unit so that the water recovered is reused.

CLAIMS

[Claim 1]

A biological treatment method comprising passing organic wastewater from a manufacturing process of electronic devices sequentially through two or more biological treatment tanks arranged in series, wherein

at least two tanks of the two or more biological treatment tanks are aerobic biological treatment tanks,

one of the aerobic biological treatment tanks is a final-stage biological treatment tank,

a pH in at least one biological treatment tank other than the final-stage biological treatment tank is adjusted by adding an acid or an alkali,

the treated water discharged from the final-stage biological treatment tank is subjected to at least one advanced treatment process selected from coagulation separation, reverse osmosis membrane separation, and ion exchange treatment, and

an addition amount of the acid or the alkali is controlled so that an M-alkalinity of a liquid in the final-stage biological treatment tank is maintained at not more than 30 mg/L as $CaCO_3$ and that an M-alkalinity of a liquid fed to the advanced treatment process is maintained at not more than 30 mg/L as $CaCO_3$.

[Claim 2]

The biological treatment method according to Claim 1, wherein the addition amount of the acid or the alkali is controlled based on the M-alkalinity of the liquid in the final-stage biological treatment tank.

[Claim 3]

The biological treatment method according to Claim 1,

wherein the at least two biological treatment tanks include an aerobic tank, nitrification tank, and a reaeration tank, the organic waste water being passed in this order,

wherein the addition amount of the acid or the alkali is controlled based on a correlation previously determined with respect to the M-alkalinity of the liquid in the reaeration tank of the final-stage biological treatment tank, and

wherein the indicator correlated with the M-alkalinity is the pH of the liquid in the aerobic tank to which the acid or the alkali is added, and the addition amount of the acid or the alkali is controlled based on a correlation previously determined with respect to the M-alkalinity and the pH.

[Claim 4]

The biological treatment method according to any one of Claims 1 to 3, wherein the aerobic biological treatment tank(s) other than the final-stage biological treatment tank

is a nitrification tank, and the pH in the nitrification tank is controlled to be not less than a prescribed value.

[Claim 5]

The biological treatment method according to any one of Claims 1 to 4, further comprising recovering and reusing the water treated by the advanced treatment process.

[Claim 6]

A biological treatment apparatus comprising two or more biological treatment tanks arranged in series through which organic wastewater from a process of manufacturing electronic devices is sequentially passed, wherein

at least two tanks of the two or more biological treatment tanks are aerobic biological treatment tanks,

one of the aerobic biological treatment tanks is a final-stage biological treatment tank,

at least one biological treatment tank other than the final-stage biological treatment tank has a pH adjusting unit that adjusts the pH by adding an acid or an alkali,

the apparatus includes at least one advanced treatment unit selected from a coagulation separation unit, a reverse osmosis membrane separation unit and an ion exchange treatment unit so that the advanced treatment unit treats treated water discharged from the final-stage biological treatment tank, and

the apparatus includes a controller for controlling an

addition amount of the acid or the alkali by the pH adjusting unit so that an M-alkalinity of a liquid in the final-stage biological treatment tank is maintained at not more than 50 mg/L as $CaCO_3$.

[Claim 7]

The biological treatment apparatus according to Claim 7, wherein the controller controls the addition amount of the acid or the alkali by the pH adjusting unit based on the M-alkalinity of the liquid in the final-stage biological treatment tank or an indicator correlated with the M-alkalinity.

[Claim 8]

The biological treatment apparatus according to Claim 8,

wherein the at least two biological treatment tanks include an aerobic tank, nitrification tank, and a reaeration tank, the organic waste water being passed in this order,

wherein the addition amount of the acid or the alkali is controlled based on a correlation previously determined with respect to the M-alkalinity of the liquid in the reaeration tank of the final-stage biological treatment tank, and

wherein the indicator correlated with the M-alkalinity is the pH of the liquid in the aerobic tank to which the acid or the alkali is added, and the controller controls the

addition amount of the acid or the alkali by the pH adjusting unit based on a correlation previously determined with respect to the M-alkalinity and the pH.

[Claim 9]

The biological treatment apparatus according to any one of Claims 6 to 8, wherein the aerobic biological treatment tank(s) other than the final-stage biological treatment tank is a nitrification tank, and the apparatus includes a controller that controls the pH in the nitrification tank to be not less than a prescribed value.

[Claim 10]

The biological treatment apparatus according to any one of Claims 6 to 9, wherein the apparatus includes a recovery unit that recovers the treated water from the advanced treatment unit so that the water recovered is reused.