CLAIMS

1. A microorganism quantity measurement cell, comprising:

a measurement chamber configured to measure the number of microorganisms included in a sample liquid;

an inflow aperture through which the sample liquid flows into the measurement chamber;

an outflow aperture through which the sample liquid flows out of the measurement chamber;

a measurement electrode that is provided in the measurement chamber at a position toward the outflow aperture, and to which is applied a measurement-use AC voltage for trapping the microorganisms included in a sample liquid flowing from the inflow aperture to the outflow aperture in the measurement chamber and for counting the number of the microorganisms;

a concentration electrode provided in the measurement chamber at a position toward the inflow aperture, and to which is applied a concentration-use AC voltage that produces a repulsive force for guiding microorganisms included in the sample liquid; and

an insulator provided on the concentration electrode, and in which an electric field concentration portion is formed in a part in which a repulsive force is produced when concentration-use AC voltage is applied to the concentration electrode.

2. The microorganism quantity measurement cell according to Claim 1,

wherein the measurement electrode is provided on a first face of the measurement chamber that is parallel to the direction in which the sample liquid flows inside the measurement chamber,

the concentration electrode is provided on a second face of the measurement chamber that is opposite the first face and is parallel to the direction in which the sample liquid flows inside the measurement chamber.

3. The microorganism quantity measurement cell according to Claim 2,

wherein the electric field concentration portion produces the repulsive force in a direction that is substantially perpendicular to the first and second faces.

4. The microorganism quantity measurement cell according to Claim 2 or 3,

wherein the electric field concentration portion produces the repulsive force in a direction that is parallel to the first face so that the microorganisms contained in the sample liquid will be drawn to the measurement electrode in the measurement chamber when the concentration-use AC voltage is applied to the concentration electrode.

5. The microorganism quantity measurement cell according to Claim 4,

wherein the electric field concentration portion is disposed diagonally to the direction in which the sample liquid flows in the measurement chamber, so that the microorganisms will be guided toward the measurement electrode in a plan view of the measurement electrode.

7. The microorganism quantity measurement cell according to any of Claims 1 to 5,

wherein the insulator is formed on the concentration electrode so as to contact a part of the concentration electrode with the sample liquid.

8. A microorganism quantity measurement device, comprising:

the microorganism quantity measurement cell according to any of Claims 1 to 7;

a specimen reservoir connected to the inflow aperture of the microorganism quantity measurement cell;

a return path to the specimen reservoir, connected to the outflow aperture of the microorganism quantity measurement cell;

a measurement section and a measurement AC power supply connected to the measurement electrode of the microorganism quantity measurement cell;

a control computer connected to the measurement section and the measurement AC power supply; and

a concentration AC power supply connected to the concentration electrode of the microorganism quantity measurement cell.

CLAIMS

1. A microorganism quantity measurement cell, comprising:

a measurement chamber configured to measure the number of microorganisms included in a sample liquid;

an inflow aperture through which the sample liquid flows into the measurement chamber;

an outflow aperture through which the sample liquid flows out of the measurement chamber;

a measurement electrode provided in the measurement chamber at a position toward the outflow aperture;

a concentration electrode provided in the measurement chamber at a position toward the inflow aperture; and

an insulator provided on the concentration electrode,

wherein the measurement electrode is provided on a first face of the measurement chamber that is parallel to the direction in which the sample liquid flows inside the measurement chamber,

the concentration electrode is provided on a second face of the measurement chamber that is opposite the first face and is parallel to the direction in which the sample liquid flows inside the measurement chamber, and

an electric field concentration portion is formed in a part in which a repulsive force is produced by the insulator when concentration-use AC voltage is applied to the concentration electrode.

2. The microorganism quantity measurement cell according to Claim 1,

wherein the insulator is formed so as to cover part of the concentration electrode.

3. The microorganism quantity measurement cell according to Claim 2,

wherein the insulator is formed in a substantially isosceles triangular shape on the second face.

4. The microorganism quantity measurement cell according to Claim 3,

wherein the insulator is disposed so that the apex portion of the substantially isosceles triangular shape is opposite the measurement electrode in plan view.

5. The microorganism quantity measurement cell according to Claim 1,

wherein the electric field concentration portion produces the repulsive force in a direction that is substantially perpendicular to the first and second faces.

6. The microorganism quantity measurement cell according to Claim 5,

wherein the electric field concentration portion produces the repulsive force in a direction that is parallel to the first face so that the microorganisms contained in the sample liquid will be drawn to the measurement electrode in the measurement chamber when the concentration-use AC voltage is applied to the concentration electrode.

7. The microorganism quantity measurement cell according to Claim 6,

wherein the electric field concentration portion is disposed diagonally to the direction in which the sample liquid flows in the measurement chamber, so that the microorganisms will be guided toward the measurement electrode in a plan view of the measurement electrode.

8. A microorganism quantity measurement device, comprising:

the microorganism quantity measurement cell according to Claim 1;

a specimen reservoir connected to the inflow aperture;

a return path to the specimen reservoir, connected to the outflow aperture;

a measurement section and a measurement AC power supply connected to the measurement electrode;

a control computer connected to the measurement section and the measurement AC power supply; and

a concentration AC power supply connected to the concentration electrode.