What is claimed is:

1. A membrane forming device, comprising:

a base (10);

a main body (20) arranged to the base (10) and the main body (20) having a recess; and

an opening member (30) arranged inside a recess port on an end of the recess away from the base (10), and a hollow portion (32) of the opening member (30) being configured to form a membrane (80).

2. The membrane forming device according to claim 1, wherein the recess is configured to define an accommodating chamber (21) for accommodating a polar medium solution, the membrane (80) is an amphipathic molecular membrane, and a cross-sectional area of the hollow portion (32) of the opening member (30) is smaller than that of the accommodating chamber (21).

3. The membrane forming device according to claim 1 or 2, wherein the main body (20) comprises:

a first body layer (22) arranged to a surface of the base (10); and

a second body layer (23) located on a side of the first body layer (22) away from the base (10),

wherein the recess penetrates the second body layer (23) and the first body layer (22) in a direction perpendicular to the base (10), and the opening member (30) is connected to a portion of the recess penetrating the second body layer (23).

4. The membrane forming device according to any one of claims 1 to 3, wherein the opening member (30) comprises:

a flange (31) protruding radially inwardly relative to the recess port,

wherein an inner edge of the flange (31) forms the hollow portion (32).

5. The membrane forming device according to claim 4, wherein the inner edge of the flange (31) is located on a same plane.

6. The membrane forming device according to any one of claims 4 to 5, wherein a cantilevered end of the flange (31) is chamfered or rounded.

7. The membrane forming device according to any one of claims 4 to 6, wherein a section of the flange (31) is T-shaped or in a shape of a convex polygon.

8. The membrane forming device according to any one of claims 4 to 7, wherein a thickness of the cantilevered end of the flange

(31) in a direction perpendicular to the base (10) is equal to or less than a thickness of a root portion of the flange (31) in the direction perpendicular to the base (10).

9. The membrane forming device according to any one of claims 4 to 8, wherein a thickness of the flange (31) in the direction perpendicular to the base (10) gradually decreases from the root portion to the cantilevered end.

10. The membrane forming device according to any one of claims 4 to 9, wherein the flange (31) has at least one portion that protrudes or recesses from a surface of the flange (31) in a direction perpendicular to the base (10).

11. The membrane forming device according to claim 10, wherein the at least one portion is at least located on a side of the flange (31) away from the base (10).

12. The membrane forming device according to any one of claims 4 to 11, wherein the inner edge of the flange (31) has a plurality of protrusions protruding inwardly.

13. The membrane forming device according to claim 2, further comprising:

a first electrode (51) arranged outside the accommodating chamber (21); and

a second electrode (52) arranged inside the accommodating chamber (21);

wherein the base (10) comprises:

a substrate (11); and

at least one passivation layer (12, 13), arranged between the substrate (11) and the main body (20),

wherein the second electrode (52) is exposed from a bottom of the recess; and

the second electrode (52) is located between the substrate (11) and the at least one passivation layer (12, 13), or the second electrode (52) is located on a side of the at least one passivation layer (12, 13) away from the substrate (11), or the second electrode (52) is located between adjacent passivation layers (12, 13) in a case where the at least one passivation layer (12, 13) is configured as a plurality of passivation layers (12, 13).

14. The membrane forming device according to any one of claims 1 to 13, wherein the opening member (30) has a plurality of hollow portions (32).

15. The membrane forming device according to claim 2 or 13, further comprising:

a sealing cover plate (60) configured to be assembled with the main body (20);

an amphipathic molecular membrane (80) formed in the hollow portion (32) of the opening member (30);

a first polar medium solution (M1) accommodated in the accommodating chamber (21), and

a second polar medium solution (M4) accommodated outside the accommodating chamber (21) and located above the main body (20), the opening member (30) and the amphipathic molecular membrane (80).

16. A membrane forming method, comprising:

providing the membrane forming device according to any one of claims 1 to 15, and assembling a sealing cover plate (60) to an upper side of the main body (20) to form a flow channel between the sealing cover plate (60) and the main body (20);

introducing a first polar medium solution (M1) into the flow channel so that the first polar medium solution (M1) flows into a recess of the main body (20) from a hollow portion (32) of an opening member (30) and fills the recess of the main body (20); and

removing the first polar medium solution (M1) between the opening member (30) and the sealing cover plate (60), and causing a non-polar medium solution (M3) and a second polar medium solution (M4) to cover the opening member (30),

wherein at least one of the non-polar medium solution (M3) and

the second polar medium solution (M4) contains amphipathic molecules to form an amphipathic molecular membrane (80) in the hollow portion (32).

17. The membrane forming method according to claim 16, wherein the step of removing the first polar medium solution (M1) between the opening member (30) and the sealing cover plate (60) comprises:

introducing a gas medium (M2) into the flow channel so as to remove the first polar medium solution (M1) between the main body (20) and the sealing cover plate (60) and between the opening member (30) and the sealing cover plate (60) through the gas medium (M2).

18. The membrane forming method according to claim 17, wherein the step of causing the non-polar medium solution (M3) and the second polar medium solution (M4) to cover the opening member (30) comprises:

introducing the non-polar medium solution (M3) into the flow channel so that the non-polar medium solution (M3) covers the opening member (30); and

introducing the second polar medium solution (M4) into the flow channel so that the second polar medium solution (M4) covers the opening member (30).

19. The membrane forming method according to claim 17, wherein the step of causing the non-polar medium solution (M3) and the second polar medium solution (M4) to cover the opening member (30) comprises:

removing the sealing cover plate (60);

coating the non-polar medium solution (M3) to the main body (20) and the opening member (30) and causing the non-polar medium solution (M3) to cover the opening member (30);

assembling the sealing cover plate (60) to the upper side of the main body (20) to form a flow channel between the sealing cover plate (60) and the main body (20); and

introducing the second polar medium solution (M4) into the flow channel so that the second polar medium solution (M4) covers the opening member (30).

20. The membrane forming method according to claim 16, wherein the step of removing the first polar medium solution (M1) between the opening member (30) and the sealing cover plate (60), and causing the non-polar medium solution (M3) and the second polar medium solution (M4) to cover the opening member (30) comprises:

introducing the non-polar medium solution (M3) into the flow channel so as to remove a first polar medium solution (M1) between the main body (20) and the sealing cover plate (60) and a first polar medium solution (M1) between the opening member (30) and the

sealing cover plate (60) by virtue of the non-polar medium solution (M3), and to achieve coverage of the opening member (30) by the non-polar medium solution (M3); and

introducing the second polar medium solution (M4) into the flow channel so that the second polar medium solution (M4) covers the opening member (30).