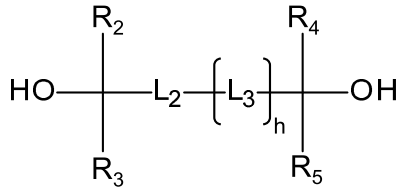
Claims

1. A rinse composition comprising:

a lithography material which is a diol derivative represented by below formula (V);



formula (V)

wherein

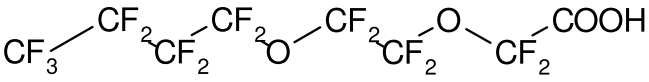
R_2, R_3 R_4 and R_5 are independently hydrogen, fluorine or C_{1-5} alkyl,

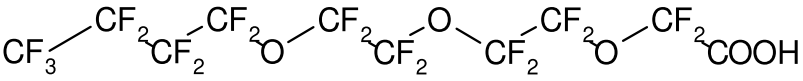
L_2 and L_3 are independently unsubstituted or fluorine-substituted C_{1-5} alkane linker, unsubstituted or fluorine-substituted C_{2-4} alkene linker, or unsubstituted or fluorine-substituted C_{2-4} alkyne linker, and

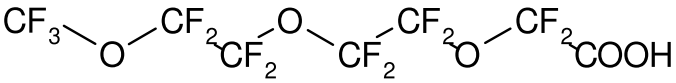
h is 0, 1 or 2,

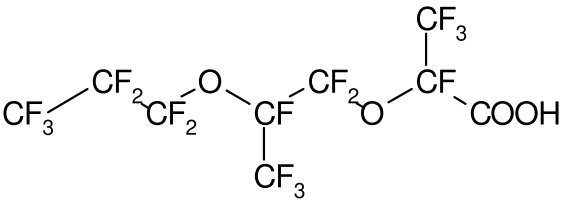
water; and

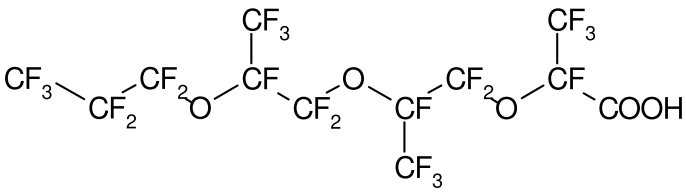
a surfactant wherein the surfactant is represented by following formulae

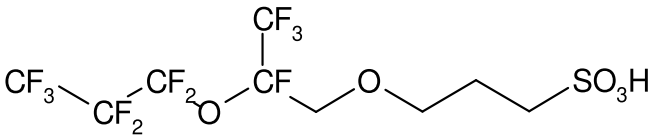


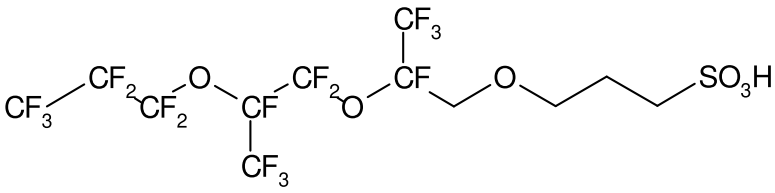


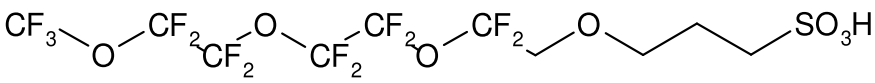


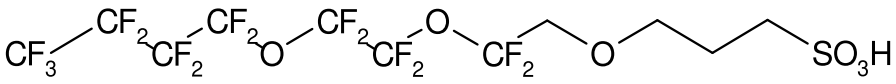


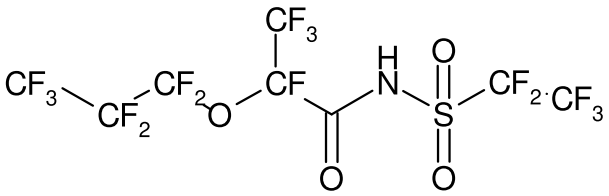


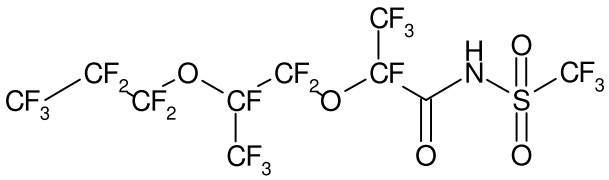












, or a mixture thereof.

2. The rinse composition according to claim 1, wherein the content ratio of the surfactant is on or more than 0.005 and on or less than 0.5 mass% based on the total mass of the rinse composition.

3. The rinse composition according to claim 1 or 2, wherein the content ratio of the lithography material is on or more than 0.01 and on or less than 0.5 mass% based on the total mass of the rinse composition.

4. The rinse composition according to at least one of claims 1 to 3, wherein the rinse composition further comprises at least one additional component selected from acids, bases, surfactants other than the surfactant and an organic solvent other than the diol derivative represented by formula (V).

5. The rinse composition according to at least one of claims 1 to 4, wherein the rinse composition further comprises at least one additional component selected from fungicides, antimicrobial agents, preservatives and antifungal agents.

6. The rinse composition according to at least one of claims 1 to 5, wherein the lithography material is selected from the group consisting of 3-Hexyn-2,5-diol, 2,5-Dimethyl-3-hexyne-2,5-diol, 3,6-Dimethyl-4-octyne-3,6-diol, 1,4-Butynediol, 2,4-Hexadiyne-1,6-diol, 1,4-Butanediol, 2,2,3,3-Tetrafluoro-1,4-butanediol, 2,2,3,3,4,4,5,5-Octafluoro-1,6-hexanediol, cis-1,4-Dihydroxy-2-butene, and a mixture thereof.

7. The rinse composition according to at least one of claims 1 to 6, wherein the content ratio of water is 80.00 to 99.98 mass% based on the total mass of the rinse composition.

8. A lithography method for forming resist patterns comprising applying the rinse composition according to at least one of claims of 1 to 7 to a substrate.

9. The lithography method for forming resist patterns according to claim 8, wherein the method comprises:
(1) applying a photosensitive resin composition on a substrate, with or without one or more intervening layers, to make a photosensitive resin composition layer,
(2) exposing the photosensitive resin composition layer to radiation,
(3) developing the exposed photosensitive resin composition layer, and
(4) rinsing the developed layer with the rinse composition.

10. The lithography method for forming resist patterns according to claim 8 or 9, wherein the photosensitive resin composition is a chemically amplified photosensitive resin composition and the exposure is an exposure with extreme ultra violet radiation.

11. The lithography method for forming resist patterns according to at least one of claims 8 to 10, wherein the finest pitch size of the resist pattern on one whole circuit unit is on or more than 10 nm to on or less than 20 nm.

12. A semiconductor device manufacturing method comprising the lithography method for forming resist patterns according to at least one of claims 8 to 11.

13. The semiconductor device manufacturing method according to claim 12, further comprising;
making gaps in the substrate by using the formed resist patterns as a mask.