CLAIMS

1. A surface treatment agent for surface treatment of a workpiece, comprising the following components:

(I) at least one kind selected from the group consisting of silicon compounds represented by the following general formulas [1] and [3];

(II) at least one kind selected from the group consisting of a nitrogen-containing heterocyclic compound represented by the following general formula [4], a nitrogen-containing heterocyclic compound represented by the following general formula [5], and imidazole; and

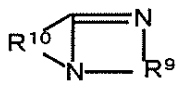
(III) an organic solvent

$$(R^1)_a(H)_bSi[N(R^2)C(=O)R^3]_{4-a-b} \qquad [1]$$

where R^1 is each independently a monovalent hydrocarbon group of 1 to 18 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom; R^2 is each independently an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom; R^3 is each independently an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom; a is an integer of 1 to 3; b is an integer of 0 to 2; and the sum of a and b is 1 to 3,

$$(R^6)_e(H)_fSi[OC(R^7)=NSi(R^8)_g(H)_{3-g}]_{4-e-f} \qquad [3]$$

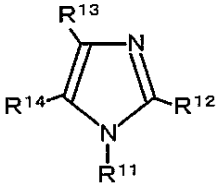
where R^6 and R^8 are each independently a monovalent hydrocarbon group of 1 to 18 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom; R^7 is each independently a group selected from the group consisting of an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, and a hydrogen atom; e is an integer of 1 to 3; f is an integer of 0 to 2; g is an integer of 1 to 3; and the sum of e, f and g is 1 to 3,



[4]

where R^9 and R^{10} are each independently a divalent organic group consisting of carbon and/or nitrogen and hydrogen; the total number of carbon and nitrogen atoms in the divalent organic group is 1 to 9; and, when the total number of carbon and nitrogen atoms

in the divalent organic group is 2 or more, there may be present any carbon atom without constituting a cyclic structure, and



[5]

where R^{11} is an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, a trialkylsilyl group having an alkyl group of 1 to 8 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, an alkenyl group of 2 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, an alkoxy group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, an amino group, an alkylamino group having an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, a dialkylamino group having an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, an aminoalkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, a nitro group, a cyano group, a phenyl group, a benzyl group, or a halogen atom; R^{12}, R^{13} and R^{14} are each independently an alkyl group of 1 to 6 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom, or a hydrogen atom.

2. The surface treatment agent according to claim 1, wherein, in the general formula [5], R^{11} is an alkyl of 1 to 4 carbon atoms or a trimethylsilyl group, and R^{12}, R^{13} and R^{14} are hydrogen atoms.

3. The surface treatment agent according to claim 1 or 2, wherein the component (II) is at least one selected from the group consisting of 1,5-diazabicyclo[4.3.0]-5-nonene, 1,8-diazabicyclo[5.4.0]-7-undecene, 7-methyl-1,5,7-triazabicyclo[4.4.0]dec-5-ene, N-methylimidazole, N-ethylimidazole, N-propylimidazole, N-butylimidazole and trimethylsilylimidazole.

4. The surface treatment agent according to claim 3, wherein the component (II) is

at least one selected from the group consisting of 1,5-diazabicyclo[4.3.0]-5-nonene, 1,8-diazabicyclo[5.4.0]-7-undecene and 7-methyl-1,5,7-triazabicyclo[4.4.0]dec-5-ene.

5. The surface treatment agent according to any one of claims 1 to 4, wherein the surface treatment agent contains, as the component (I), at least one kind of silicon compound represented by the general formula [1] where a is 3; R^2 is a methyl group; and R^3 is a fluorine-containing alkyl group of 1 to 6 carbon atoms.

6. The surface treatment agent according to claim 5, wherein $(CH_3)_3SiN(CH_3)C(=O)CF_3$ is contained as the component (I).

7. The surface treatment agent according to any one of claims 1 to 4, wherein the surface treatment agent contains, as the component (I), at least one kind of silicon compound represented by the general formula [3] where e and g are 3; and R^7 is a methyl group or a trifluoromethyl group.

8. The surface treatment agent according to claim 7, wherein $(CH_3)_3SiOC(CF_3)=NSi(CH_3)_3$ is contained as the component (I).

9. A surface treatment agent for surface treatment of a workpiece, comprising the following components:

(I) at least one kind selected from the group consisting of silicon compounds represented by the following general formula [2];

(II) at least one kind selected from the group consisting of 1,5-diazabicyclo[4.3.0]-5-nonene, 1,8-diazabicyclo[5.4.0]-7-undecene, 7-methyl-1,5,7-triazabicyclo[4.4.0]dec-5-ene, N-methylimidazole, N-ethylimidazole, N-propylimidazole and N-butylimidazole; and

(III) an organic solvent

$$(R^4)_c(H)_dSi[OC(=O)R^5]_{4-c-d} \qquad [2]$$

where R^4 is each independently a monovalent hydrocarbon group of 1 to 18 carbon atoms in which a part or all of hydrogen atoms may be substituted with a fluorine atom; R^5 is each independently an alkyl group of 1 to 6 carbon atoms in which a part or all of

hydrogen atoms may be substituted with a fluorine atom; c is an integer of 1 to 3; d is an integer of 0 to 2; and the sum of c and d is 1 to 3.

10. The surface treatment agent according to claim 9,
wherein the component (II) is at least one selected from the group consisting of 1,5-diazabicyclo[4.3.0]-5-nonene, 1,8-diazabicyclo[5.4.0]-7-undecene and 7-methyl-1,5,7-triazabicyclo[4.4.0]dec-5-ene.

11. The surface treatment agent according to claim 9 or 10, wherein, in the general formula [2], c is 3; and R^5 is a fluorine-containing alkyl group of 1 to 6 carbon atoms.

12. The surface treatment agent according to claim 11, wherein $(CH_3)_3SiOC(=O)CF_3$ is contained as the component (I).

13. The surface treatment agent according to claim 12, wherein the concentration of $(CH_3)_3SiOC(=O)CF_3$ is 1 to 20 mass% based on the total amount of the components (I) to (III).

14. The surface treatment agent according to any one of claims 9 to 11, wherein the surface treatment agent contains, as the component (I), at least one kind of silicon compound (I-1) represented by the following general formula [1] where a is 3; b is 0 R^2 is a hydrogen atom; and R^3 is a fluorine-containing alkyl group of 1 to 6 carbon atoms, and at least one kind of silicon compound (I-2) represented by the general formula [2] where c is 3; and R^5 is a fluorine-containing alkyl group of 1 to 6 carbon atoms

$$(R^1)_a(H)_bSi[N(R^2)C(=O)R^3]_{4-a-b} \quad [1]$$

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15. The surface treatment agent according to claim 14,
wherein the silicon compound (I-1) is $(CH_3)_3SiN(H)C(=O)CF_3$, and
wherein the silicon compound (I-2) is $(CH_3)_3SiOC(=O)CF_3$.

16. The surface treatment agent according to any one of claims 1 to 15, wherein the concentration of the component (II) is 0.05 to 10 mass% based on the total amount of the

components (I) to (III).

17. The surface treatment agent according to any one of claims 1 to 16, wherein the component (II) is liquid at 25°C and 1 atmospheric pressure.

18. The surface treatment agent according to any one of claims 1 to 17, wherein the concentration of the component (I) is 0.1 to 35 mass% based on the total amount of the components (I) to (III).

19. The surface treatment agent according to any one of claims 1 to 18, wherein the organic solvent is an aprotic solvent.

20. A method of manufacturing a surface-treated body, comprising: treating a surface of a workpiece by bringing the mentioned surface treatment agent according to any one of claims 1 to 19 into contact with the surface of the workpiece.