CLAIMS

What is claimed is:

1. An anti-deposition object comprising:

a main structure with at least one surface, wherein the surface of the main structure is roughened to form rough surfaces with rough structures to increase a surface roughness; and

a fluorine coating layer covering the surface of the main structure, wherein the anti-deposition object contacts with a substance in an environment, the fluorine coating layer has a water droplet contact angle with the substance higher than that of the surface of the main structure, the fluorine coating layer has a hardness similar to or higher than that of the surface of the main structure, wherein the fluorine coating layer has an acid corrosion resistance and a plasma etching resistance higher than those of the surface of the main structure, and the fluorine coating layer has a roughness lower than that of the surface of the main structure, wherein a degree of fluorination of the fluorine coating layer is correspondingly increased according to the environment in which the anti-deposition object is located.

2. The anti-deposition object as claimed in claim 1, wherein the main structure is an outlet pipe fitting of a manufacturing process equipment or a pipe fitting or a component of a peripheral equipment of the manufacturing process equipment.

3. The anti-deposition object as claimed in claim 1, wherein the fluorine coating layer is located on the surface of a part of the main structure, and the part is an inclined part, a planar part or a curved part of the main structure.

4. The anti-deposition object as claimed in claim 1, wherein the environment is a vacuum environment.

5. The anti-deposition object as claimed in claim 1, wherein the rough structures comprise grooves or notches formed by pickling, laser or sandblasting, and the fluorine coating layer fills or infiltrates the grooves or notches such that the fluorine coating layer has the roughness lower than that of the surface of the main structure, and an adhesion between the fluorine coating layer and the surface of the main structure ranges from 4B to 5B in a cross-cut test.

6. The anti-deposition object as claimed in claim 1, wherein the surface of the main structure is roughened to form the rough surfaces by pickling, laser or sandblasting to increase the surface roughness.

7. The anti-deposition object as claimed in claim 1, wherein a composition of the fluorine coating layer is composed of fluorocarbons accounting for 0.01 to 20 wt%, alkoxysilanes accounting for 5 to 50 wt%, catalytic additives accounting for 0.01 to 20 wt% and solvents accounting for 10 to 90 wt%.

8. The anti-deposition object as claimed in claim 7, wherein the fluorocarbons are selected from a group consisting of polyfluoroalkyl substances (PFAS), fluorochlorocarbons (CFCs), hydrofluorocarbons (HFCs), polytetrafluoroethylene (PTFE) and fluorinated ethylene propylene (FEP).

9. The anti-deposition object as claimed in claim 7, wherein the fluorocarbons are fluorine-containing monomers or polymers containing 1 to 20 carbon atoms.

10. The anti-deposition object as claimed in claim 7, wherein the alkoxysilanes are selected from a group consisting of alkoxysilane oligomer, alkoxysilane compound, alkoxysilane polymer, alkylsiloxane oligomer, alkylsiloxane compound, alkylsiloxane polymer, amino-alkyl siloxane oligomer, amino-alkyl siloxane compound and amino-alkyl siloxane polymer.

11. The anti-deposition object as claimed in claim 7, wherein the catalytic additives are selected from a group consisting of metals, metal oxides, phosphates and carboxylates of platinum, titanium, tin, zinc, aluminum, silver, calcium, magnesium, potassium, sodium, nickel, chromium, molybdenum, vanadium, copper, iron, cobalt, germanium, hafnium, lanthanum, lead, ruthenium, tantalum, tungsten and zirconium.

12. The anti-deposition object as claimed in claim 7, wherein the solvents are selected from a group consisting of alcohols, ketones, esters, fluoroalcohols, fluoroethers and ethers.

13. The anti-deposition object as claimed in claim 7, wherein the alkoxysilanes have reactive functional groups, and the reactive functional groups carry out a self-condensation reaction at room temperature for 1 to 7 days or carry out a self-condensation reaction at a temperature of 40 to 60 degrees Celsius for 1 to 24 hours.

14. The anti-deposition object as claimed in claim 1, wherein the environment is a vacuum

environment, the substance is a manufacturing process substance, the anti-deposition object contacts with the manufacturing process substance used or discharged during a manufacturing process performed by a manufacturing process equipment in the vacuum environment, the manufacturing process performed by the manufacturing process equipment is an atomic layer deposition (ALD) manufacturing process, and the manufacturing process substance is titanium tetrachloride ($TiCl_4$).

15. The anti-deposition object as claimed in claim 1, wherein the environment is a vacuum environment, the substance is a manufacturing process substance, the anti-deposition object contacts with the manufacturing process substance used or discharged during a manufacturing process performed by a manufacturing process equipment in the vacuum environment, the manufacturing process performed by the manufacturing process equipment is a metalorganic chemical vapor deposition (MOCVD) manufacturing process, and the manufacturing process substance is a process gas or a process exhaust gas.

16. The anti-deposition object as claimed in claim 1, wherein the environment is a vacuum environment, the substance is a manufacturing process substance, the anti-deposition object contacts with the manufacturing process substance used or discharged during a manufacturing process performed by a manufacturing process equipment in the vacuum environment, the manufacturing process performed by the manufacturing process equipment is an Al-pad manufacturing process, and the manufacturing process substance is a process gas reactant or a process exhaust gas.

17. The anti-deposition object as claimed in claim 1, wherein the water droplet contact angle of the fluorine coating layer ranges from 100° to 120°.

18. The anti-deposition object as claimed in claim 13, wherein a temperature tolerance of the fluorine coating layer reaches 600 degrees Celsius.

19. The anti-deposition object as claimed in claim 13, wherein the hardness of the fluorine coating layer ranges from 8H to 9H.

20. The anti-deposition object as claimed in claim 13, wherein an adhesion between the fluorine coating layer and the surface of the main structure ranges from 4B to 5B in a cross-cut test.

21. The anti-deposition object as claimed in claim 1, wherein the environment is a gas phase environment, a liquid phase environment or a gas-liquid mixed environment.

22. The anti-deposition object as claimed in claim 1, wherein the main structure is a part, a component or a material of building structures, power generation equipment or means of transportation.

23. The anti-deposition object as claimed in claim 1, wherein the environment is an ozone water-containing environment, and the fluorine coating layer increases the degree of fluorination correspondingly according to the ozone water-containing environment to enhance a stability to ozone water in the ozone water-containing environment.