CLAIMS

1. A metal material for a medical device, the metal material comprising:

a metal layer; and

a diamond-like carbon layer provided on the metal layer and containing fluorine and silicon in a single layer, wherein:

in the diamond-like carbon layer, a concentration of the fluorine at a surface at an opposite side from a side facing the metal layer is larger than a concentration of the fluorine at a surface at the side facing the metal layer, in a thickness direction of the diamond-like carbon layer,

in the diamond-like carbon layer, a concentration of the silicon at a surface at an opposite side from a side facing the metal layer is smaller than a concentration of the silicon at a surface at the side facing the metal layer, in a thickness direction of the diamond-like carbon layer, and

a ratio (DF:DS) of a concentration DF of the fluorine with respect to a concentration DS of the silicon at a surface of the diamond-like carbon layer at an opposite side from a side facing the metal layer is from 1:1 to 90:1, and a composition at the surface of the diamond-like carbon layer at the opposite side contains a greater amount of fluorine than silicon.

2. The metal material for a medical device according to claim 1, wherein a total concentration of the fluorine contained in the diamond-like carbon layer is from 7 atom% to 10 atom% with respect to a total concentration of carbon, fluorine, and silicon.

3. The metal material for a medical device according to claim 1 or 2, wherein a total concentration of the silicon contained in the diamond-like carbon layer is from 17 atom% to 25 atom% with respect to a total concentration of carbon, fluorine, and silicon.

4. The metal material for a medical device according to any one of claims 1 to 3,

wherein, in the diamond-like carbon layer, a ratio Cf of the concentration of the fluorine at the surface at the opposite side from the side facing the metal layer with respect to the concentration of the fluorine at the surface at the side facing the metal layer satisfies a relationship $1 < Cf \leq 155$.

5. The metal material for a medical device according to any one of claims 1 to 4, wherein a concentration of the fluorine contained in the diamond-like carbon layer gradually increases from the side facing the metal layer toward the opposite side from the side facing the metal layer in the thickness direction of the diamond-like carbon layer.

6. The metal material for a medical device according to claim 1 to 5, wherein, in the diamond-like carbon layer, a ratio Cs of the concentration of the silicon at the surface at the opposite side from the side facing the metal layer with respect to the concentration of the silicon at the surface at the side facing the metal layer satisfies a relationship $0.015 \leq Cs < 1$.

7. The metal material for a medical device according to any one of claims 1 to 6, wherein the concentration of the silicon contained in the diamond-like carbon layer gradually decreases from the side facing the metal layer toward the opposite side from the side facing the metal layer in the thickness direction of the diamond-like carbon layer.

8. The metal material for a medical device according to any one of claims 1 to 7, wherein the diamond-like carbon layer is provided as an outermost layer on the metal layer.

9. The metal material for a medical device according to any one of claims 1 to 8, wherein the metal layer contains at least one metal selected from the group consisting of titanium, nickel, cobalt, chromium, tantalum, platinum, gold, alloys thereof, and stainless steel.

10. The metal material for a medical device according to claim 9, wherein the metal layer contains a nickel-titanium alloy, a cobalt-chromium alloy, or stainless steel.

11. The metal material for a medical device according to any one of claims 1 to 10, wherein the metal material is used in a stent.

12. The metal material for a medical device according to claim 11, wherein the stent is a stent for a systemic blood vessel.

13. The metal material for a medical device according to any one of claims 1 to 12, wherein the diamond-like carbon layer has an atomic percentage concentration of fluorine at an outermost surface of 16.1 at% or more and 61.9 at% or less, and an atomic percentage concentration of silicon at an outermost surface of 0.7 at% or more and 14.6 at% or less.

14. A medical device, comprising the metal material for a medical device according to any one of claims 1 to 13.

15. The medical device according to claim 14, wherein the medical device is a stent.

16. The medical device according to claim 15, wherein the stent is a stent for a lower limb blood vessel.

17. A method of manufacturing a metal material for a medical device according to any one of claims 1 to 13, the method comprising forming a diamond-like carbon layer containing fluorine and silicon on a metal layer by vapor deposition, by a vapor phase growth method using a mixed raw material obtained by mixing a silane compound and a fluorine-containing aliphatic hydrocarbon as raw materials.