CLAIMS

1. A method for manufacturing a perpendicular magnetic recording medium, comprising the steps of:

(A) preparing a non-magnetic substrate;

(B) laminating magnetic recording layer including at least a first and a second magnetic recording layers on the non-magnetic substrate; and

(C) heating the non-magnetic substrate on which the magnetic recording layer is laminated to a temperature of 400 to 600°C, wherein

the step (B) includes at least a step of forming the first magnetic recording layer and a step of forming the second magnetic recording layer on the first magnetic recording sub-layer;

the first magnetic recording layer has a granular structure including a first magnetic crystal grain and a first non-magnetic grain boundary surrounding the first magnetic crystal grain, the first magnetic crystal grain is constituted by an ordered alloy, and the first non-magnetic grain boundary is constituted by carbon; and

the second magnetic recording layer has a granular structure including a second magnetic crystal grain and a second non-magnetic grain boundary surrounding the second crystal grain, the second magnetic crystal grain is constituted by an ordered alloy, and the second non-magnetic grain boundary is constituted by a non-magnetic material constituted by boron and

carbon.

2. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein

heating time of the step (C) is from 10 seconds to 2 hours.

3. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein

a ratio [B (at.%)/C (at.%)] based on the atomic percent ratio of boron and carbon in the non-magnetic material constituted by boron and carbon is 0.3 to 10.

4. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein

the ordered alloys contained in the first and second magnetic crystal grains are $L1_0$-type ordered alloys which are the same with or different from each other.

5. The method for manufacturing a perpendicular magnetic recording medium according to claim 4, wherein

the $L1_0$-type ordered alloys contain Fe and Pt.

6. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein

the non-magnetic substrate of the step (A) includes a seed layer, and the step (B) includes a step of forming the first magnetic recording sub-layer on the seed layer.

7. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein

an α value of a magnetic hysteresis curve [vertical axis: magnetization (emu/cm^3), lateral axis: external magnetic field (Oe)] of the perpendicular recording medium to be manufactured is 0.8 to 2.0.

CLAIMS

1. A method for manufacturing a perpendicular magnetic recording medium, comprising the steps of:

(A) preparing a non-magnetic substrate;

(B) laminating magnetic recording layers including at least a first and a second magnetic recording layers on the non-magnetic substrate; and

(C) heating the non-magnetic substrate on which the magnetic recording layers are laminated to a temperature of 400 to 600°C, wherein

the step (B) includes at least a step of forming the first magnetic recording layer and a step of forming the second magnetic recording layer on the first magnetic recording sub-layer;

the first magnetic recording layer has a granular structure including a first magnetic crystal grain and a first non-magnetic grain boundary surrounding the first magnetic crystal grain, the first magnetic crystal grain is constituted by an ordered alloy, and the first non-magnetic grain boundary is constituted by carbon; and

the second magnetic recording layer has a granular structure including a second magnetic crystal grain and a second non-magnetic grain boundary surrounding the second crystal grain, the second magnetic crystal grain is constituted by an ordered alloy, and the second non-magnetic grain boundary is constituted by a non-magnetic material constituted by boron and carbon.

2. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein heating time of the step (C) is from 10 seconds to 2 hours.

3. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein a ratio [B (at.%)/C (at.%)] based on the atomic percent ratio of boron and carbon in the non-magnetic material constituted by boron and carbon is 0.3 to 10.

4. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein the ordered alloys contained in the first and second magnetic crystal grains are $L1_0$-type ordered alloys which are the same with or different from each other.

5. The method for manufacturing a perpendicular magnetic recording medium according to claim 4, wherein the $L1_0$-type ordered alloys contain Fe and Pt.

6. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein the non-magnetic substrate of the step (A) includes a seed layer, and the step (B) includes a step of forming the first magnetic recording sub-layer on the seed layer.

7. The method for manufacturing a perpendicular magnetic recording medium according to claim 1, wherein an α value of

a magnetic hysteresis curve [vertical axis: magnetization (emu/cm^3), lateral axis: external magnetic field (Oe)] of the perpendicular recording medium to be manufactured is 0.8 to 2.0.