CLAIMS

1. A method for making a magnetic recording medium, comprising:

providing a substrate;

forming a magnetic layer on the substrate;

applying filtered cathodic vacuum arc (FCVA) deposition to form a film on the magnetic layer; and

performing nitridation on the film formed by the FCVA deposition,

wherein the performing nitridation includes:

channeling nitrogen gas into a filament-type plasma-enhanced chemical vapor deposition (PECVD) device; and

generating a plasma field between an anode and a cathode filament of the PECVD device, and

wherein a nitrogen concentration at an outermost surface of the film ranges from 15% to 17%.

2. The method of claim 1, further comprising performing, after the nitridation, a finishing process that includes forming a lubrication layer on the nitridated film.

3. The method of claim 1, wherein the applying FCVA deposition includes:
providing a poly crystal graphite target made of atom carbon;
vaporizing the atom carbon of the target using an electric arc; and
condensing the vaporized atom carbon on the magnetic layer to form the film.

4. The method of claim 1, wherein the applying FCVA deposition includes adjusting a time of the FCVA application to thereby adjust a thickness of the film.

5. The method of claim 1, wherein the nitrogen gas is channeled into the PECVD device at a flow rate of 50 sccm.

6. The method of claim 1, further comprising, immediately after the formation of the magnetic layer and before applying the FCVA deposition, transferring the substrate with the magnetic layer fanned thereon to a filtered cathodic vacuum arc (FCVA) device under a vacuum condition.

7. A method for forming a protective layer of a magnetic recording medium, the magnetic recording medium having a magnetic layer, the method comprising:
applying filtered cathodic vacuum arc (FCVA) deposition to form a film on the magnetic layer; and
performing nitridation on the film formed by the FCVA deposition,
wherein the performing nitridation includes:
channeling nitrogen gas into a filament-type plasma-enhanced chemical vapor deposition (PECVD) device; and
generating a plasma field between an anode and a cathode filament of the PECVD device, and
wherein a nitrogen concentration at an outermost surface of the film ranges from 15% to 17%.

8 The method of claim 7, wherein the applying FCVA deposition includes:
providing a poly crystal graphite target made of atom carbon;

vaporizing the atom carbon of the target using an electric arc; and
condensing the vaporized atom carbon on the magnetic layer to form the film.

9. A magnetic recording medium, comprising:
a substrate;
a magnetic layer formed on the substrate; and
a nitridated carbon protective layer formed on the magnetic layer,
wherein the nitridated carbon protective layer is formed by applying filtered cathodic vacuum arc (FCVA) deposition to form a carbon film on the magnetic layer, and subsequently performing nitridation on the carbon film formed by the FCVA deposition,
wherein the performing nitridation includes:
channeling nitrogen gas into a filament-type plasma-enhanced chemical vapor deposition (PECVD) device; and
generating a plasma field between an anode and a cathode filament of the PECVD device,
wherein a nitrogen concentration at an outermost surface of the film ranges from 15% to 17%.

10. The magnetic recording medium of claim 9, wherein the nitridated carbon protective layer is of a thickness of 1 to 2 nm.