CLAIMS

1. An alloy for a soft magnetic thin film layer in a magnetic recording medium, wherein

the alloy comprises one or more selected from the group consisting of Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Ni, Cu, Al, B, C, Si, P, Zn, Ga, Ge, and Sn, and the balance Co and Fe; and

in at%, the following formulae (1) to (~~3~~4):

(1) ~~0.50~~0.65≤Fe%/(Fe%+Co%)≤~~0.90~~0.80;

(2) ~~5~~15≤TAM≤25; ~~and~~

(3) 15≤TAM+TNM≤25; and

(4) 0≤(Nb%+Ta%)/(TAM+TNM)≤0.26

are satisfied,

with the proviso that TAM and TNM are:

TAM=Y%+Ti%+Zr%+Hf%+V%+Nb%+Ta%+B%/2; and

TNM=Cr%+Mo%+W%+Mn%+Ni%/3+Cu%/3+Al%+C%+Si%+P%+Zn%+Ga%+Ge%+Sn%,

respectively.

2. The alloy according to claim 1, wherein the following formula (~~4~~5):

(~~4~~5) 0.25≤(Nb%+Ta%)/(TAM+TNM)≤~~1.00~~0.26

is satisfied.

3. The alloy according to claim 1 or claim 2, wherein the following formulae (~~5~~6) and/or (~~6~~7):

(~~5~~6) 0≤Ti%+Zr%+Hf%+B%/2≤5

(~~6~~7) 0<Cu%+Sn%+Zn%+Ga%≤10

are satisfied.

4. The alloy according to any one of claims 1 to 3, wherein

the alloy consists of one or more selected from the group consisting of Y, Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Ni, Cu, Al, B, C, Si, P, Zn, Ga, Ge, and Sn, and the balance Co and Fe; and

in at%, the following formulae (1) to (~~3~~4):

(1) ~~0.50~~0.65≤Fe%/(Fe%+Co%)≤~~0.90~~0.80;

(2) ~~5~~15≤TAM≤25; ~~and~~

(3) 15≤TAM+TNM≤25; and

(4) 0≤(Nb%+Ta%)/(TAM+TNM)≤0.26

are satisfied,

with the proviso that TAM and TNM are:

TAM=Y%+Ti%+Zr%+Hf%+V%+Nb%+Ta%+B%/2; and

TNM=Cr%+Mo%+W%+Mn%+Ni%/3+Cu%/3+Al%+C%+Si%+P%+Zn%+Ga%+Ge%+Sn%,

respectively.

5. The alloy according to any one of claims 1 to 4, wherein the alloy has a saturation magnetic flux density of more than 0.5 T and less than 1.1 T.

6. A sputtering target material for producing a soft magnetic thin film comprising the alloy according to any one of claims 1 to 5.