CLAIMS

1. A rubber compounding oil comprising:

an extract (A) having

an aniline point of 40-90°C,

a $\%C_A$ of 25-45 and a $\%C_N$ of 5-20 according to ASTM D3238,

a nitrogen content of 0.01 mass% or greater,

a pour point of no higher than +30°C,

a benzo(a)pyrene content of no greater than 1 ppm by mass,

a total content of indicated aromatic compounds of no greater than 10 ppm by mass, and

a 40°C dynamic viscosity of 650 mm^2/s or greater; and

a lubricant base oil (B) having

a pour point of no higher than -10°C,

an aniline point of 70°C or higher,

a $\%C_A$ of 3-20 and a $\%C_N$ of 15-35 according to ASTM D3238,

a nitrogen content of no greater than 0.01 mass%,

a 90% point of 500°C or higher in GC distillation,

a flash point of 250°C or higher,

a benzo(a)pyrene content of no greater than 1 ppm by mass and

a total content of indicated aromatic compounds of no greater than 10 ppm by mass.

2. The rubber compounding oil according to claim 1,

wherein the extract (A) is an extract obtained by extraction by contacting a polar solvent with deasphalted oil obtained by deasphalting of a vacuum distillation residue oil of atmospheric distillation residue oil from crude oil, in one or two stages.

3. The rubber compounding oil according to claim 1,

wherein the extract (A) includes an extract obtained by a two-stage polar solvent extraction step, the extract being obtained by contacting a polar solvent with a raffinate obtained by contacting a polar solvent with a vacuum distillation fraction of atmospheric distillation residue oil from crude oil in a first extraction column having a bottom temperature of 30-90°C and a top temperature that is higher than the bottom temperature, in a second extraction column having a bottom temperature and top temperature that are at least 10°C higher than those of the first extraction column,

wherein the extract has a 15°C density of 0.94 g/cm^3 or greater and a total aromatic content of 30 mass% or greater according to ASTM D2549.

4. The rubber compounding oil according to any one of claims 1 to 3,

wherein the lubricant base oil (B) comprises a dewaxing oil (c) of a first raffinate obtained by a one-stage polar solvent extraction step and/or a dewaxing oil (d) of a second raffinate obtained by a two-stage polar solvent extraction step,

the dewaxing oil (c) being obtained by refining treatment including a dewaxing step on a first raffinate obtained by contacting a polar solvent with a vacuum distillation fraction of an atmospheric distillation residue oil from a crude oil in a first extraction column having a bottom temperature of 30-90°C and a top temperature that is higher than the bottom temperature, and

the dewaxing oil (d) being obtained by refining treatment including a dewaxing step on a second raffinate obtained by contacting

a polar solvent with the first raffinate, in a second extraction column having a bottom temperature and a top temperature that are at least 10°C higher than those of the first extraction column.

5. A method for producing a rubber compounding oil comprising:

a step of mixing

an extract (A) having an aniline point of 40-90°C, a $\%C_A$ of 25-45 and a $\%C_N$ of 5-20 according to ASTM D3238, a nitrogen content of 0.01 mass% or greater, a pour point of no higher than +30°C, a benzo(a)pyrene content of no greater than 1 ppm by mass, a total content of indicated aromatic compounds of no greater than 10 ppm by mass, and a 40°C dynamic viscosity of 650 mm^2/s or greater, with

a lubricant base oil (B) having a pour point of no higher than -10°C, an aniline point of 70°C or higher, a $\%C_A$ of 3-20 and a $\%C_N$ of 15-35 according to ASTM D3238, a nitrogen content of no greater than 0.01 mass%, a 90% point of 500°C or higher in GC distillation, a flash point of 250°C or higher, a benzo(a)pyrene content of no greater than 1 ppm by mass and a total content of indicated aromatic compounds of no greater than 10 ppm by mass.

CLAIMS

1. A rubber compounding oil comprising:

an extract (A) having

an aniline point of 40-90°C,

a $\%C_A$ of 25-45 and a $\%C_N$ of 5-20 according to ASTM D3238,

a nitrogen content of 0.01 mass% or greater,

a pour point of no higher than +30°C,

a benzo(a)pyrene content of no greater than 1 ppm by mass,

a total content of indicated aromatic compounds of no greater than 10 ppm by mass, and

a 40°C dynamic viscosity of 650 mm^2/s or greater; and

a lubricant base oil (B) having

a pour point of no higher than -10°C,

an aniline point of 70°C or higher,

a $\%C_A$ of 3-20 and a $\%C_N$ of 15-35 according to ASTM D3238,

a nitrogen content of no greater than 0.01 mass%,

a 90% point of 500°C or higher in GC distillation,

a flash point of 250°C or higher,

a benzo(a)pyrene content of no greater than 1 ppm by mass and

a total content of indicated aromatic compounds of no greater than 10 ppm by mass, and

wherein a pour point of the rubber compounding oil is no higher than +5°C.

2. The rubber compounding oil according to claim 1,

wherein the extract (A) is an extract obtained by extraction by contacting a polar solvent with deasphalted oil obtained by deasphalting

of a vacuum distillation residue oil of atmospheric distillation residue oil from crude oil, in one or two stages.

3. The rubber compounding oil according to claim 1 or 2,

wherein the extract (A) includes an extract obtained by a two-stage polar solvent extraction step, the extract being obtained by contacting a polar solvent with a raffinate obtained by contacting a polar solvent with a vacuum distillation fraction of atmospheric distillation residue oil from crude oil in a first extraction column having a bottom temperature of 30-90°C and a top temperature that is higher than the bottom temperature, in a second extraction column having a bottom temperature and top temperature that are at least 10°C higher than those of the first extraction column,

wherein the extract has a 15°C density of 0.94 g/cm^3 or greater and a total aromatic content of 30 mass% or greater according to ASTM D2549.

4. The rubber compounding oil according to any one of claims 1 to 3,

wherein the lubricant base oil (B) comprises a dewaxing oil (c) of a first raffinate obtained by a one-stage polar solvent extraction step and/or a dewaxing oil (d) of a second raffinate obtained by a two-stage polar solvent extraction step,

the dewaxing oil (c) being obtained by refining treatment including a dewaxing step on a first raffinate obtained by contacting a polar solvent with a vacuum distillation fraction of an atmospheric distillation residue oil from a crude oil in a first extraction column having a bottom temperature of 30-90°C and a top temperature that is higher than the bottom temperature, and

the dewaxing oil (d) being obtained by refining treatment including a dewaxing step on a second raffinate obtained by contacting a polar solvent with the first raffinate, in a second extraction column having a bottom temperature and a top temperature that are at least 10°C higher than those of the first extraction column.

5. The rubber compounding oil according to any one of claims 1 to 4, wherein the content ratio of the extract (A) is 40-90 mass% and the content ratio of the lubricant base oil (B) is 10-60 mass%.

6. The rubber compounding oil according to any one of claims 1 to 5, wherein the rubber compounding oil has a pour point lower than a predicted pour point calculated from the pour point and the content ratio of each of the extract (A) and the lubricant base oil (B), assuming establishment of an additive property.

7. A method for producing a rubber compounding oil comprising:
a step of mixing

an extract (A) having an aniline point of 40-90°C, a $\%C_A$ of 25-45 and a $\%C_N$ of 5-20 according to ASTM D3238, a nitrogen content of 0.01 mass% or greater, a pour point of no higher than +30°C, a benzo(a)pyrene content of no greater than 1 ppm by mass, a total content of indicated aromatic compounds of no greater than 10 ppm by mass, and a 40°C dynamic viscosity of 650 mm^2/s or greater, with

a lubricant base oil (B) having a pour point of no higher than -10°C, an aniline point of 70°C or higher, a $\%C_A$ of 3-20 and a $\%C_N$ of 15-35 according to ASTM D3238, a nitrogen content of no greater than 0.01 mass%, a 90% point of 500°C or higher in GC distillation, a flash point of 250°C or higher, a benzo(a)pyrene content of no greater than 1

ppm by mass and a total content of indicated aromatic compounds of no greater than 10 ppm by mass.

wherein a pour point of the rubber compounding oil is no higher than +5°C.