CLAIMS

1. A method for producing a highly aromatic base oil comprising:

hydrorefining a clarified oil to obtain a hydrorefined oil; and

fractionation-treating and/or adsorption-treating the hydrorefined oil to obtain a highly aromatic base oil having an aromatic content of 50% by mass or more determined by a column chromatography analysis method,

a content of benzo(a)pyrene of 1 ppm by mass or less, and

a total content of the following aromatic compounds 1) to 8):

1) benzo(a)pyrene,

2) benzo(e)pyrene,

3) benzo(a)anthracene,

4) chrysene,

5) benzo(b)fluoranthene,

6) benzo(j)fluoranthene,

7) benzo(k)fluoranthene, and

8) dibenzo(a,h)anthracene

of 10 ppm by mass or less;

wherein the highly aromatic base oil has a kinematic viscosity at 40°C of 100 mm^2/s or more.

2. The method for producing a highly aromatic base oil according to claim 1, wherein the hydrorefining the clarified oil is performed under conditions of

a hydrogen pressure of 5.0 to 20.0 MPa,

a temperature of 280 to 400°C.,

a hydrogen oil ratio of 300 to 750 NL/L, and

a space velocity of 0.3 to 2.0h^{-1}.

3. A method for producing a mixed-base oil comprising:

hydrorefining a clarified oil to obtain a hydrorefined oil; fractionation-treating and/or adsorption-treating the

hydrorefined oil to obtain a highly aromatic base oil having

an aromatic content of 50% by mass or more determined by a column chromatography analysis method,

a content of benzo(a)pyrene of 1 ppm by mass or less, and

a total content of the following aromatic compounds 1) to 8):

1) benzo(a)pyrene,

2) benzo(e)pyrene,

3) benzo(a)anthracene,

4) chrysene,

5) benzo(b)fluoranthene,

6) benzo(j)fluoranthene,

7) benzo(k)fluoranthene, and

8) dibenzo(a,h)anthracene

of 10 ppm by mass or less;

wherein the highly aromatic base oil has a kinematic viscosity at 40°C. of 100 mm^2/s or more; and

mixing the highly aromatic base oil and one or more base oils selected from a mineral oil and a synthetic oil other than the highly aromatic base oil to obtain a mixed-base oil having

an aromatic content of 50% by mass or more determined by a column chromatography analysis method,

an aniline point of 100°C. or less,

% $C_{\backslash}$ of 20 to 80 according to ASTM D2140,

a pour point of +10°C. or less,

a glass-transition point of -30°C. to -60°C.,

a rate of aromatic carbon of 0.1 to 0.5,

a content of benzo(a)pyrene of 1 ppm by mass or less, and a total content of the following aromatic compounds 1) to 8):

1) benzo(a)pyrene,

2) benzo(e)pyrene,

3) benzo(a)anthracene,

4) chrysene,

5) benzo(b)fluoranthene,

6) benzo(j)fluoranthene,

7) benzo(k)fluoranthene, and

8) dibenzo(a,h)anthracene

of 10 ppm by mass or less.

4. A highly aromatic base oil obtained by the producing method according to claim 1, wherein

the highly aromatic base oil has an aromatic content of 50% by mass or more determined by a column chromatography analysis method,

an aniline point of 60°C. or less,

% C_A of 30 to 80 according to ASTM D2140,

a pour point of +10°C. or less,

a glass-transition point of -30°C. to -60°C., and

a rate of aromatic carbon of 0.1 to 0.7.

5. A mixed-base oil comprising the highly aromatic base oil according to claim 4 and one or more base oils selected from a mineral oil and a synthetic oil other than the highly aromatic base oil, wherein

the mixed-base oil has

an aromatic content of 50% by mass or more determined by a column chromatography analysis method,

an aniline point of 100°C. or less,

% C_A of 20 to 80 according to ASTM D2140,

a pour point of +10°C. or less,

a glass-transition point of -30°C. to -60°C., and

a rate of aromatic carbon of 0.1 to 0.5.