CLAIMS

WHAT IS CLAIMED IS:

1. An asphalt composition comprising:

a hydrocarbonaceous fraction comprising a dynamic viscosity at 130°C of 8.0 P or more measured according to AASHTO T44 and a high temperature performance grade of 58 or higher according to AASHTO R29, wherein the hydrocarbonaceous fraction is deasphalter rock; and

2.0 wt% to 20 wt% of a bio-oil, based on a combined weight of the hydrocarbonaceous fraction and the bio-oil, the asphalt composition comprising a high temperature performance grade of 58 or higher according to AASHTO R29 and a low temperature performance grade of -10 or lower according to AASHTO R29.

2. The asphalt composition of claim 1, wherein the asphalt composition comprises 40 wt% or more, such as or 70 wt% or more, of the hydrocarbonaceous fraction relative to a total weight of the asphalt composition.

3. The asphalt composition of any of the above claims, wherein the hydrocarbonaceous fraction comprises a high temperature performance grade of 70 or higher according to AASHTO R29, or wherein the hydrocarbonaceous fraction comprises a low temperature performance grade of -4 or higher according to AASHTO R29, or a combination thereof.

4. The asphalt composition of any of the above claims, wherein the asphalt composition further comprises 1.0 wt% to 50 wt% of a vacuum resid fraction relative to a total weight of the asphalt composition, the vacuum resid fraction comprising 10 wt% or more of n-heptane asphaltenes, 20 wt% or more of micro carbon residue, or a combination thereof.

5. The asphalt composition of any of the above claims, i) wherein the asphalt composition further comprises 1.0 wt% to 10 wt% of a deasphalted oil fraction, a vacuum gas oil fraction, or a combination thereof, relative to a total weight of the asphalt composition, and wherein the asphalt composition comprises a greater weight percentage of the bio-oil than the weight percentage of the deasphalted oil fraction, the vacuum gas oil fraction, or the combination thereof; or ii) wherein the asphalt composition comprises less than 1.0 wt% of a deasphalted oil fraction, a vacuum gas oil fraction, or a combination thereof.

6. The asphalt composition of any of the above claims, wherein the hydrocarbonaceous fraction comprises a) a density at 15°C of 1.10 g/cm^3 to 1.25 g/cm^3 according to ASTM D4052; b) an n-heptane insolubles content of 25 wt% to 75 wt% according to ASTM D3279; c) a hydrogen content of 6.5 wt% to 8.4 wt% according to ASTM D5291; d) a micro carbon residue content of 40 wt% to 75 wt% according to ASTM D4530; or e) a combination of two or more of a) – d).

7. The asphalt composition of any of the above claims, wherein the hydrocarbonaceous fraction comprises a deasphalter rock fraction formed by solvent deasphalting using a C_{4+} deasphalting solvent.

8. A base asphalt composition comprising:

an asphalt fraction comprising an asphalt composition according to any one of claims 1-7; and

11 wt% to 25 wt% of a further bio-oil based on a total weight of the asphalt fraction and the further bio-oil, the asphalt composition comprising 5.0 wt% or less of an oxidized bio-oil relative to a weight of the asphalt composition, the asphalt composition comprising a high temperature performance grade of 52 or lower according to AASHTO R29 and a penetration at 25°C of 300 dmm or lower according to ASTM D312.

9. The asphalt composition of claim 8, wherein the bio-oil comprises 10 wt% or more of esters relative to a weight of the bio-oil, or wherein the bio-oil comprises 10 wt% or more of triglycerides relative to a weight of the bio-oil, or a combination thereof.

10. A method for producing an oxidized asphalt composition, according to claim 8 or claim 9, comprising: mixing i) said asphalt fraction, and ii) 11 wt% to 25 wt% of said additional bio-oil based on a total weight of the asphalt fraction and the bio-oil, the asphalt composition comprising 5.0 wt% or less of oxidized bio-oil relative to a weight of the asphalt composition, to form an asphalt composition, the asphalt composition comprising a high temperature performance grade of 52 or lower according to AASHTO R29 and a penetration at 25°C of 300 dmm or lower according to ASTM D312; and oxidizing the asphalt composition to form an oxidized asphalt composition comprising a penetration at 25°C of 12 dmm or more and a softening point of 99°C or higher according to ASTM D312.

11. The method for producing an oxidized asphalt composition of claim 10, wherein the oxidized asphalt composition comprises a high temperature performance grade of 82 or higher according to AASHTO R29.

12. An oxidized asphalt composition formed according to the method of claim 10 or 11.

13. The asphalt composition of any of claims 1 – 9 or 12, wherein the asphalt composition comprises a carbon intensity that is lower than a carbon intensity of the hydrocarbonaceous fraction by at least 20%.

14. The asphalt composition of any of claims 1 – 9, 12 or 13, wherein the bio-oil comprises 0.1 to 5.0 wt% of compounds containing oxidized functional groups, relative to a weight of the bio-oil.