velocity of 1.0 rad/s is in a range of 1.40×10^{-4} or more and 2.90×10^{-4} or less;

(4) the zero shear viscosity [η_0 (P)] at 200°C and the weight average molecular weight (Mw) as measured by GPC-viscometry (GPC-VISCO) satisfy the following equation (Eq-1):

$$0.01 \times 10^{-13} \times Mw^{3.4} \leq \eta_0 \leq 3.0 \times 10^{-13} \times Mw^{3.4} \quad \text{... (Eq-1);}$$

(5) the number average molecular weight (Mn), the weight average molecular weight (Mw), and the Z average molecular weight (Mz) as measured by GPC-viscometry (GPC-VISCO) satisfy the following equation (Eq-2):

$$-2.0 \leq Mz/Mw - Mw/Mn \leq 15 \quad \text{... (Eq-2);}$$

(6) the total number of vinyls, vinylidenes, disubstituted internal olefins, and trisubstituted internal olefins per 1000 carbon atoms (number/1000 C) as measured by ^{1}H-NMR is in a range of 0.1 or more and 1.0 or less; and

(7) a plurality of peaks is present in a melting curve obtained by differential scanning calorimetry (DSC).

[0008b]

In another aspect of the present disclosure, there is provided a thermoplastic resin composition (Y) comprising: the ethylene-α-olefin copolymer (A) as disclosed herein, and a thermoplastic resin excluding the ethylene-α-olefin copolymer (A).

CLAIMS

[Claim 1]

An ethylene-α-olefin copolymer (A) which is a copolymer of ethylene and one or more α-olefins having 4 to 10 carbon atoms, and which satisfies the following requirements (1) to (7):

(1) the density is in a range of 890 kg/m^3 or more and 925 kg/m^3 or less;

(2) the melt flow rate (MFR) at 190°C under a load of 2.16 kg is in a range of 3.0 g/10 min or more and 15.0 g/10 min or less;

(3) the ratio [MT/η^* (g/P)] of the melt tension [MT (g)] at 190°C to the shear viscosity [η^* (P)] at 200°C at the angular velocity of 1.0 rad/s is in a range of 1.40×10^{-4} or more and 2.90×10^{-4} or less;

(4) the zero shear viscosity [η_0 (P)] at 200°C and the weight average molecular weight (Mw) as measured by GPC-viscometry (GPC-VISCO) satisfy the following equation (Eq-1):

$$0.01 \times 10^{-13} \times Mw^{3.4} \leq \eta_0 \leq 3.0 \times 10^{-13} \times Mw^{3.4} \quad \ldots \text{(Eq-1)};$$

(5) the number average molecular weight (Mn), the weight average molecular weight (Mw), and the Z average molecular weight (Mz) as measured by GPC-viscometry (GPC-VISCO) satisfy the following equation (Eq-2):

$-2.0 \leq Mz/Mw - Mw/Mn \leq 15$ ... (Eq-2);

(6) the total number of vinyls, vinylidenes, disubstituted internal olefins, and trisubstituted internal olefins per 1000 carbon atoms (number/1000 C) as measured by ^{1}H-NMR is in a range of 0.1 or more and 1.0 or less; and

(7) a plurality of peaks is present in a melting curve obtained by differential scanning calorimetry (DSC).

[Claim 2]

The ethylene-α-olefin copolymer (A) according to claim 1, further satisfying the following requirement (8):

(8) the ratio Mz/Mw of the Z average molecular weight (Mz) to the weight average molecular weight (Mw) as measured by GPC-viscometry (GPC-VISCO) is in a range of 4.0 or more and 25.0 or less.

[Claim 3]

The ethylene-α-olefin copolymer (A) according to claim 1 or 2, further satisfying the following requirement (9):

(9) the intrinsic viscosity [[η] (dl/g)] measured in decalin at 135°C and the weight average molecular weight (Mw) as measured by GPC-viscometry (GPC-VISCO) satisfy the following equation (Eq-4):

$0.8 \times 10^{-4} \times Mw^{0.776} \leq [\eta] \leq 1.65 \times 10^{-4} \times Mw^{0.776}$ ... (Eq-4).

[Claim 4]

A thermoplastic resin composition (Y) comprising: the ethylene-α-olefin copolymer (A) according to any one of claims 1 to 3, and a thermoplastic resin excluding the ethylene-α-olefin copolymer (A).

[Claim 5]

The thermoplastic resin composition (Y) according to claim 4, wherein

the thermoplastic resin is an ethylene-α-olefin copolymer (B) satisfying the following requirements (a) to (d), and

the composition is an ethylene resin composition (Z) having a mass faction (W_A) of the ethylene-α-olefin copolymer (A) that is 5% by mass or more and 90% by mass or less and a mass fraction (W_B) of the ethylene-α-olefin copolymer (B) that is 10% by mass or more and 95% by mass or less, with the proviso that the sum of W_A and W_B is 100% by mass:

(a) the density is in a range of 890 kg/m^3 or more and 930 kg/m^3 or less;

(b) the melt flow rate (MFR) at 190°C under a load of 2.16 kg is in a range of 0.1 g/10 min or more and 20 g/10 min or less;

(c) the ratio [MT/η^* (g/P)] of the melt tension [MT (g)] at 190°C to the shear viscosity [η^* (P)] at 200°C at the angular

velocity of 1.0 rad/s is in a range of 1.0×10^{-6} or more and 1.0×10^{-4} or less; and

(d) the amount (%) of a component with a Log molecular weight of 5.8 or more in a molecular weight distribution curve obtained by GPC measurement is in a range of 0.01% or more and 5.0% or less.

[Claim 6]

A film comprising the ethylene-α-olefin copolymer (A) according to any one of claims 1 to 3 or the thermoplastic resin composition (Y) according to claim 4 or 5.

[Claim 7]

The film according to claim 6, comprising the ethylene-α-olefin copolymer (A) according to any one of claims 1 to 3.

[Claim 8]

The film according to claim 6, comprising the thermoplastic resin composition (Y) according to claim 4.

[Claim 9]

The film according to claim 6, comprising the thermoplastic resin composition (Y) according to claim 5.

[Claim 10]

A laminate comprising a layer comprising the ethylene-α-olefin copolymer (A) according to any one of claims 1 to 3 or the thermoplastic resin composition (Y) according to claim 4 or 5.

[Claim 11]

The laminate according to claim 10, further comprising a substrate layer.

[Claim 12]

The laminate according to claim 11, further comprising a barrier layer.

[Claim 13]

The laminate according to any one of claims 10 to 12, comprising the layer comprising the ethylene-α-olefin copolymer (A) according to any one of claims 1 to 3.

[Claim 14]

The laminate according to any one of claims 10 to 12, comprising the layer comprising the thermoplastic resin composition (Y) according to claim 4.

[Claim 15]

The laminate according to any one of claims 10 to 12, comprising the layer comprising the thermoplastic resin composition (Y) according to claim 5.

[Claim 16]

A method for producing a laminate, comprising extrusion-laminating the ethylene-α-olefin copolymer (A) according to any one of claims 1 to 3 or the thermoplastic resin composition (Y) according to claim 4 or 5 between a substrate layer and a barrier layer.