polypropylene resin, an ethylene·α-olefin random copolymer and a butene·α-olefin random copolymer.

[0004]

Further, JP-A-H11-245355 (Patent Literature 2) discloses a sealant composition which is made by blending a specific propylene·1-butene random copolymer with a specific 1-butene·α-olefin random copolymer.

[0005]

Although films (packages) formed with these compositions show some improvements in low-temperature heat sealability, it is often the case that the films are sticky. Further, difficulties are encountered in controlling the heat seal strength within a certain definite range when heat sealing takes place at low temperatures. In the packaging applications, this causes variations in the strength required to open the packages. Further, the strength required to open packages is apt to change with the lapse of time, and quality control is frequently difficult.

CITATION LIST

PATENT LITERATURE

[0006]

Patent Literature 1: JP-A-H11-221884

Patent Literature 2: JP-A-H11-245355

SUMMARY ~~OF INVENTION~~

TECHNICAL PROBLEM

[0007]

The present ~~invention~~ disclosure proposes compositions aimed at remedying these problems. In detail, the ~~invention~~ present disclosure provides compositions suited as sealants or easy peel sealants which may be easily formed with a low-temperature heat seal strength controlled within a certain definite range by virtue of the selection of a specific 1-butene·α-olefin copolymer.

SOLUTION TO PROBLEM

[0007a]

In one aspect of the present disclosure, there is provided a 1-butene·α-olefin copolymer composition comprising:

99 to 1 parts by mass of at least one olefin polymer (X) selected from propylene polymers (X-1) containing 50 mol% or more of propylene and ethylene polymers (X-2) containing 50 mol% or more of ethylene; and

1 to 99 parts by mass of a 1-butene·α-olefin copolymer (Y) containing 99.9 to 70 mol% of 1-butene and 0.1 to 30 mol% of one or more α-olefins selected from ethylene, propylene and C5 to C12 α-olefins (wherein the total of the 1-butene and the one or more α-olefins selected from ethylene, propylene and C5 to C12 α-olefins is 100 mol%) and having a molecular weight distribution (Mw/Mn) of 1.0 to 3.5 and having a pentad

isotacticity (mmmm) of 80 to 96.5% (wherein the total of the olefin polymer (X) and the 1-butene·α-olefin copolymer (Y) in the composition is 100 parts by mass).

[0008]

The present ~~invention~~ disclosure also provides ~~has~~ the following ~~aspects~~.

[0009]

(1) ~~An aspect of the invention resides in a~~A 1-butene·α-olefin copolymer composition including:

99 to 1 parts by mass of at least one olefin polymer (X) selected from propylene polymers (X-1) containing 50 mol% or more of propylene and ethylene polymers (X-2) containing 50 mol% or more of ethylene; and

1 to 99 parts by mass of a 1-butene·α-olefin copolymer (Y) containing 99.9 to 70 mol% of 1-butene and 0.1 to 30 mol% of one or more α-olefins selected from ethylene, propylene and C5 to C12 α-olefins (wherein the total of the 1-butene and the one or more α-olefins selected from ethylene, propylene and C5 to C12 α-olefins is 100 mol%) and having a molecular weight

described in (5), it is preferable that the olefin polymer (X) be a propylene polymer (X-1) and the 1-butene·α-olefin copolymer (Y) be a 1-butene·propylene copolymer (Y-2).

[0019]

(11) In the 1-butene·α-olefin copolymer composition described in (5), the 1-butene·propylene copolymer (Y-2) is preferably a 1-butene·propylene copolymer having an elution amount using o-dichlorobenzene at -10°C of not more than 3 mass%.

[0020]

(12) In the 1-butene·α-olefin copolymer composition described in (5), it is preferable that the total amount of elution using o-dichlorobenzene at temperatures of not more than [Ts]°C be 1.0 mass% to 5.0 mass% wherein [Ts] is characterized by the equation: [Ts] = [C4] - 60 wherein [C4] is the proportion in mol% of 1-butene in the 1-butene·propylene copolymer (Y-2).

[0021]

(13) ~~Another aspect of the invention resides in a~~A 1-butene·ethylene copolymer including 99.9 to 85 mol% of 1-butene and 0.1 to 15 mol% of ethylene (wherein the total of the 1-butene and the ethylene is 100 mol%) and having a molecular weight distribution (Mw/Mn) of 1.0 to 3.5.

[0022]

(14) The 1-butene·ethylene copolymer described in (13)

preferably has an elution amount using o-dichlorobenzene at -10°C of not more than 3 mass%.

[0023]

(15) ~~Another aspect of the invention resides in a~~A 1-butene·propylene copolymer including 99.9 to 70 mol% of 1-butene and 0.1 to 30 mol% of propylene (wherein the total of the 1-butene and the propylene is 100 mol%) and having a molecular weight distribution (Mw/Mn) of 1.0 to 3.5.

[0024]

(16) The 1-butene·propylene copolymer described in (15) preferably has an elution amount using o-dichlorobenzene at -10°C of not more than 3 mass%.

[0025]

(17) In the 1-butene·propylene copolymer described in (15) or (16), it is preferable that the total amount of elution using o-dichlorobenzene at temperatures of not more than [Ts]°C be 1.0 mass% to 5.0 mass% wherein [Ts] is characterized by the equation: [Ts] = [C4] - 60 wherein [C4] is the proportion in mol% of 1-butene in the copolymer.

ADVANTAGEOUS EFFECTS OF INVENTION

[0026]

When used in packaging films, the 1-butene·α-olefin copolymer compositions of the invention not only exhibit excellent low-temperature heat sealing properties but are free

CLAIMS

[Claim 1]

A 1-butene·α-olefin copolymer composition comprising:

99 to 1 parts by mass of at least one olefin polymer (X) selected from propylene polymers (X-1) containing 50 mol% or more of propylene and ethylene polymers (X-2) containing 50 mol% or more of ethylene; and

1 to 99 parts by mass of a 1-butene·α-olefin copolymer (Y) containing 99.9 to 70 mol% of 1-butene and 0.1 to 30 mol% of one or more α-olefins selected from ethylene, propylene and C5 to C12 α-olefins (wherein the total of the 1-butene and the one or more α-olefins selected from ethylene, propylene and C5 to C12 α-olefins is 100 mol%) and having a molecular weight distribution (Mw/Mn) of 1.0 to 3.5 and having a pentad isotacticity (mmmm) of 80 to 96.5% (wherein the total of the olefin polymer (X) and the 1-butene·α-olefin copolymer (Y) in the composition is 100 parts by mass).

[Claim 2]

The 1-butene·α-olefin copolymer composition according to claim 1, wherein the olefin polymer (X) is one or more polymers selected from propylene polymers (X-1).

[Claim 3]

The 1-butene·α-olefin copolymer composition according to

claim 2, wherein the propylene polymer (X-1) is one or more polymers selected from propylene random copolymers.

[Claim 4]

The 1-butene·α-olefin copolymer composition according to claim 1, wherein the olefin polymer (X) is one or more polymers selected from ethylene polymers (X-2).

[Claim 5]

The 1-butene·α-olefin copolymer composition according to claim 1, wherein the 1-butene·α-olefin copolymer (Y) is at least one or more copolymers selected from 1-butene·ethylene copolymers (Y-1) containing 99.9 to 85 mol% of 1-butene and 0.1 to 15 mol% of ethylene [wherein the total of the 1-butene and the ethylene is 100 mol%] and 1-butene·propylene copolymers (Y-2) containing 99.9 to 70 mol% of 1-butene and 0.1 to 30 mol% of propylene (wherein the total of the 1-butene and the propylene is 100 mol%).

~~[Claim 6]~~

~~The 1-butene·α-olefin copolymer composition according to claim 1, wherein the 1-butene·α-olefin copolymer (Y) has a pentad isotacticity (mmmm) of not less than 80%.~~

[Claim ~~7~~6]

The 1-butene·α-olefin copolymer composition according to claim 1, wherein the ethylene polymer (X-2) is one or more polymers selected from high-pressure low-density polyethylenes and linear low-density polyethylenes.

[Claim ~~8~~7]

The 1-butene·α-olefin copolymer composition according to claim 5, wherein the olefin polymer (X) is a propylene polymer (X-1) and the 1-butene·α-olefin copolymer (Y) is a 1-butene·ethylene copolymer (Y-1).

[Claim ~~9~~8]

The 1-butene·α-olefin copolymer composition according to claim 5, wherein the 1-butene·ethylene copolymer (Y-1) is a 1-butene·ethylene copolymer having an elution amount using o-dichlorobenzene at -10°C of not more than 3 mass%.

[Claim ~~10~~9]

The 1-butene·α-olefin copolymer composition according to claim 5, wherein the olefin polymer (X) is a propylene polymer (X-1) and the 1-butene·α-olefin copolymer (Y) is a 1-butene·propylene copolymer (Y-2).

[Claim ~~11~~10]

The 1-butene·α-olefin copolymer composition according to claim 5, wherein the 1-butene·propylene copolymer (Y-2) is a 1-butene·propylene copolymer having an elution amount using o-dichlorobenzene at -10°C of not more than 3 mass%.

[Claim ~~12~~11]

The 1-butene·α-olefin copolymer composition according to claim 5, wherein the total amount of elution using o-dichlorobenzene at temperatures of not more than [Ts]°C is 1.0 mass% to 5.0 mass% wherein [Ts] is characterized by the equation: [Ts] = [C4] - 60 wherein [C4] is the proportion in mol% of 1-butene in the 1-butene·propylene copolymer (Y-2).

~~[Claim 13]~~

~~A 1-butene·ethylene copolymer comprising 99.9 to 85 mol% of 1-butene and 0.1 to 15 mol% of ethylene (wherein the total of the 1-butene and the ethylene is 100 mol%) and having a molecular weight distribution (Mw/Mn) of 1.0 to 3.5.~~

~~[Claim 14]~~

~~The 1-butene·ethylene copolymer according to claim 13, which has an elution amount using o-dichlorobenzene at -10°C of not more than 3 mass%.~~

[Claim 15]

A 1-butene·propylene copolymer comprising 99.9 to 70 mol% of 1-butene and 0.1 to 30 mol% of propylene (wherein the total of the 1-butene and the propylene is 100 mol%) and having a molecular weight distribution (Mw/Mn) of 1.0 to 3.5.

[Claim 16]

The 1-butene·propylene copolymer according to claim 15, which has an elution amount using o-dichlorobenzene at 10°C of not more than 3 mass%.

[Claim 17]

The 1-butene·propylene copolymer according to claim 15 or 16, wherein the total amount of elution using o-dichlorobenzene at temperatures of not more than [Ts]°C is 1.0 mass% to 5.0 mass% wherein [Ts] is characterized by the equation: [Ts] = [C4] - 60 wherein [C4] is the proportion in mol% of 1-butene in the 1-butene·propylene copolymer.