CLAIMS

1.

A film comprising a propylene-based polymer or a propylene-based polymer composition and satisfying requirements (1) to (3) below:

(1) satisfying an inequality (I) below,

$-0.35 < BO^{MD} - BO^{TD} < 1.00$ (I)

wherein

BO^{MD} represents a degree of orientation in a MD direction of the film measured using a birefringence method, and

BO^{TD} represents a degree of orientation in a TD direction of the film measured using the birefringence method;

(2) satisfying an inequality (II) below,

$I_{0.2}^{MD}/I_{0.6}^{TD} < 1.5$ (II)

wherein

$I_{0.2}^{MD}$ represents an intensity at a position of a scattering vector q of 0.2 nm^{-1} in a Kratky plot in the MD direction of the film measured using a small-angle X-ray scattering method, and

$I_{0.6}^{TD}$ represents an intensity at a position of a scattering vector q of 0.6 nm^{-1} in a Kratky plot in the TD direction of the film measured using the small-angle X-ray

scattering method; and

(3) satisfying an inequality (III) below,

$I_{0.2}^{TD}/I_{0.6}^{MD} < 1.5$ (III)

wherein

$I_{0.2}^{TD}$ represents an intensity at a position of the scattering vector q of 0.2 nm^{-1} in the Kratky plot in the TD direction of the film measured using the small-angle X-ray scattering method, and

$I_{0.6}^{MD}$ represents an intensity at a position of the scattering vector q of 0.6 nm^{-1} in the Kratky plot in the MD direction of the film measured using the small-angle X-ray scattering method.

2.

The film according to claim 1, further satisfying a requirement (4) below:

(4) satisfying an inequality (IV) below,

$Int_1/Int_2 > 1.1$ (IV)

wherein

Int_1 represents a peak-top intensity in the TD direction of a (110) plane of an α-crystal in the propylene-based polymer in a two-dimensional scattering image of the film measured using a wide-angle X-ray scattering method, and

Int_2 represents a peak-top intensity at 45° from the

TD direction of the (110) plane of the α-crystal in the propylene-based polymer in the two-dimensional scattering image of the film measured using the wide-angle X-ray scattering method.

3.

The film according to claim 1 or 2, further satisfying a requirement (5) below:

(5) a diffraction peak of a (040) plane of the α-crystal in the propylene-based polymer measured using a wide-angle X-ray diffraction method is at 16.81° or more.

4.

The film according to any one of claims 1 to 3, further satisfying a requirement (6) below:

(6) satisfying an inequality (V) below,

$$0.5 \times (Int_A + Int_B)/Int_C > 1.1 \quad (V)$$

wherein,

Int_A represents the peak-top intensity in the TD direction of the (110) plane of the α-crystal in the propylene-based polymer in the two-dimensional scattering image of the film measured using the wide-angle X-ray scattering method,

Int_B represents a peak-top intensity in the MD direction of the (110) plane of the α-crystal in the

propylene-based polymer in the two-dimensional scattering image of the film measured using the wide-angle X-ray scattering method, and

Int_C represents the peak-top intensity at 45° from the TD direction of the (110) plane of the α-crystal in the propylene-based polymer in the two-dimensional scattering image of the film measured using the wide-angle X-ray scattering method.

5.

A method for producing a film, the method comprising:

an extruding step of, with an extruder, heat-melting and extruding onto a cooling roll a propylene-based polymer composition containing a propylene-based polymer and at least one stretchability improving agent selected from the group consisting of a β-crystal nucleating agent and a hydrocarbon resin, to give an unstretched sheet;

a MD stretching step of stretching the unstretched sheet obtained, with a stretching roll, by 8 times to 10 times in a MD direction to give a uniaxially stretched sheet;

a TD stretching step of stretching the uniaxially stretched sheet obtained, with chucks arranged in two rows along the MD direction, in a heating furnace, by 4 times to 20 times in a TD direction to give a biaxially stretched

film; and

a relaxing step of relaxing a stretch in the TD direction of the biaxially stretched film obtained, with the chucks arranged in two rows along the MD direction, in the heating furnace, by 16% to 30% in the TD direction.

6.

A propylene-based polymer composition comprising a propylene-based polymer and a stretchability improving agent, and

satisfying requirements (11) to (16) below:

(11) a melt flow rate measured at a temperature of 230°C and a load of 2.16 kg is 1 g/10 min to 10 g/10 min;

(12) a die swell ratio measured at a temperature of 230°C and a load of 2.16 kg is 1.23 to 1.45;

(13) a ratio (Mw/Mn) between a weight average molecular weight (Mw) and a number average molecular weight (Mn) measured by gel permeation chromatography is 4.0 to 7.0;

(14) a ratio (Mz/Mn) between a Z-average molecular weight (Mz) and the number average molecular weight (Mn) measured by the gel permeation chromatography is 10.0 to 25.0;

(15) an amount of a component having a molecular weight measured by the gel permeation chromatography of

100000 or less is 30 mass% to 50 mass%; and

(16) an amount of a component having a molecular weight measured by the gel permeation chromatography of 1500000 or more is 2.3 mass% to 5.0 mass%.

7.

The propylene-based polymer composition according to claim 6, wherein the stretchability improving agent is at least one selected from the group consisting of a β-crystal nucleating agent and a hydrocarbon resin.

8.

A method for producing a film, the method comprising:

an extruding step of, with an extruder, heat-melting and extruding onto a cooling roll a propylene-based polymer composition containing a propylene-based polymer and at least one stretchability improving agent selected from the group consisting of a β-crystal nucleating agent and a hydrocarbon resin, to give an unstretched sheet;

a MD stretching step of stretching the unstretched sheet obtained, with a stretching roll, by 6 times to 10 times in a MD direction to give a uniaxially stretched sheet;

a TD stretching step of stretching the uniaxially stretched sheet obtained, with chucks arranged in two rows

along the MD direction, in a heating furnace, by 4 times to 20 times in a TD direction to give a biaxially stretched film; and

a relaxing step of relaxing a stretch in the TD direction of the biaxially stretched film obtained, with the chucks arranged in two rows along the MD direction, in the heating furnace, by 16% to 30% in the TD direction,

wherein the temperature of the stretching roll for stretching the unstretched sheet in the MD direction is 142 to 165°C.