film, black or white printing is performed on a side surface on which an optical adhesive layer is formed. Since a printed portion requires concealability, a printing ink layer having a certain thickness or more is formed thereon. Upon multistage printing of the cover glass or the cover plastic film and the optical adhesive layer, it is necessary to attach the optical adhesive layer to a stepped portion of the printing ink layer without a gap therebetween. Accordingly, the optical adhesive layer is required to have step-filling properties by which the adhesive layer fills a gap due to the stepped portion of the printing ink layer.

Examples of an adhesive (or a bonding agent) for optical films, an adhesive layer for optical films and a stacked structure are disclosed in JP Patent Unexamined Publication No. 2017-125195, JP Patent Publication No. 2015-524011, and the like.

Summary

In an aspect, there is provided a photocurable adhesive composition for optical films, comprising: a main component and a chain transfer agent,

wherein the main component comprises (a): a (meth)acrylic acid ester copolymer comprising:

about 15 wt% to about 55 wt% of a constituent unit derived from a component (a1): a (meth)acrylic acid ester monomer having a linear or branched C_1 to C_{14} alkyl group;

about 10 wt% to about 55 wt% of a constituent unit derived from a component (a2): a (meth)acrylic acid ester monomer having a cyclic C_3 to C_{14} alkyl group;

about 5 wt% to about 35 wt% of a constituent unit derived from a component (a3): a hydroxyl group-containing (meth)acrylic acid ester monomer; and

about 5 wt% to about 35 wt% of a constituent unit derived from a component (a4): an amide group-containing monomer,

(provided that the sum of the constituent units derived from the components (a1) to (a4) is 100 wt% and the constituent unit derived from the component (a1) is present in an amount of about 20 wt% to about 60 wt% based on the total amount of the constituent units derived from the components (a1) and (a2)), and

wherein the chain transfer agent is present in an amount of about 0.01 parts by weight to about 5 parts by weight, relative to 100 parts by weight of the main component.

In another aspect, there is provided a photocurable adhesive composition for optical films, comprising: a syrup obtained through partial polymerization of a (meth)acrylic acid ester monomer composition; a UV absorbent; and a chain transfer agent, wherein the UV absorbent is present in an amount of about 0.010 parts by weight to about 5 parts by weight and the chain transfer agent is present in an amount of about 0.010 parts by weight to about 5 parts by weight, relative to 100 parts by weight of the syrup.

In another aspect, there is provided a photocurable adhesive layer for optical films formed of the photocurable adhesive composition for optical as defined above.

In another aspect, there is provided an optical member comprising a cured product of the photocurable adhesive layer for optical films as defined above and a first optical member disposed on one surface of the cured product of the adhesive layer.

In another aspect, there is provided a display apparatus comprising at least one optical member as defined above.

In another aspect, there is provided a method of forming a photocurable adhesive layer for optical films, comprising:

coating the photocurable adhesive composition for optical films as defined above onto a surface of a first release sheet subjected to release treatment to form a coating layer;

stacking a second release sheet on the coating layer such that a surface of the second release sheet subjected to release treatment adjoins a surface of the coating layer; and

irradiating the coating layer with actinic energy through at least one of the first release sheet and the second release sheet.

It is one example of the present disclosure to provide a photocurable adhesive composition for optical films, which can form an adhesive layer having good step-filling properties.

It is another example of the present disclosure to provide a photocurable adhesive composition that can form an adhesive layer having durability under harsh conditions (high temperature, high humidity, thermal shock), exhibiting good property in terms of haze after moist heat durability testing, good properties in terms of processability and adhesive strength, and allowing reduction in permittivity.

In accordance with one example of the present disclosure, a photocurable adhesive composition for optical films includes a main component and a chain transfer agent, wherein the main component includes (a) a (meth)acrylic acid ester copolymer, the (meth)acrylic acid ester copolymer including about 15 wt% to about 55 wt% of a constituent unit derived from a component (a1): a linear or branched C_1 to C_{14} alkyl group-containing (meth)acrylic acid ester monomer; about 10 wt% to about 55 wt% of a constituent unit derived from a component (a2): a cyclic C_3 to C_{14} alkyl group-containing (meth)acrylic acid ester monomer; about 5 wt% to about 35 wt% of a constituent unit derived from a component (a3): a hydroxyl group-containing (meth)acrylic acid ester monomer; and about 5 wt% to about 35 wt% of a constituent unit derived from a

component (a4): an amide group-containing monomer, (provided that the sum of the constituent units derived from the components (a1) to (a4) is 100 wt% and the constituent unit derived from the component (a1) is present in an amount of about 20 wt% to about 60 wt% based on the total amount of the constituent units derived from the components (a1) and (a2)), and wherein the chain transfer agent is present in an amount of about 0.01 parts by weight to about 5 parts by weight relative to 100 parts by weight of the main component.

In accordance with another example of the present disclosure, a photocurable adhesive composition for optical films includes a syrup obtained through partial polymerization of a (meth)acrylic acid ester monomer composition, a UV absorbent, and a chain transfer agent, wherein the UV absorbent is present in an amount of about 0.010 parts by weight to about 5 parts by weight and the chain transfer agent is present in an amount of about 0.010 parts by weight to about 5 parts by weight, relative to 100 parts by weight of the syrup.

According to the present disclosure, it is possible to provide an adhesive composition capable of forming an adhesive layer having good step-filling properties.

According to the present disclosure, it is possible to provide an adhesive composition that can form an adhesive layer having durability under harsh conditions (high temperature, high humidity, thermal shock), exhibiting good property in terms of haze after moist heat durability testing, good properties in terms of processability and adhesive strength, and allowing reduction in permittivity.

Brief Description of Drawings

FIG. 1 is a cross-sectional view of a thin polarizing plate.

FIG. 2 is a perspective view of a sample for creep testing.

Detailed Description of the Invention

Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings. However, it should be understood that the present invention is not limited to the following embodiments and is defined only by the claims.