MULTILAYERED POLYOLEFIN FILMS, METHODS OF MANUFACTURE THEREOF AND ARTICLES COMPRISING THE SAME

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. non-provisional application having Serial No. 14/183,949 filed on February 19, 2014, the entire contents of which are hereby incorporated by reference.

BACKGROUND

[0001] This disclosure relates to multilayered polyolefin films, methods of manufacture thereof and to articles comprising the same.

[0002] Tube laminates (also known as "lamitube") are widely used for packages such as toothpaste tubes, cosmetics, and viscous food products. A typical lamitube structure 12 is shown in the Figure 1 and consists of an outer film 2, an adhesive film 4, an aluminum film 6, an adhesive film 8, and an inner film 10. Multilayered polyolefin films are often used as the outer film and inner film. It is desirable for the outer film to display high stiffness and optical properties, whereas it is desirable for the inner film to provide hermetic sealing, good stiffness/toughness balance and minimum off-taste and odor.

[0003] There is a constant drive to cut packaging costs by reducing the thickness of films used in such laminates. However, this causes poor stiffness of the lamitube as well as loss in the ability of the lamitube to bounce back, which is not acceptable to the consumers. Incorporation of higher density polyethylene grades to compensate for the loss in stiffness results in poor environmental stress crack resistance and an undesirable increase in haze.

[0004] It is therefore desirable to use a lamitube that has an effective stiffness to enable it to bounce back while at the same time having the requisite environmental stress crack resistance and transparency.

SUMMARY

[0005] ~~Disclosed herein~~In one aspect, there is provided a multilayer film comprising two outer layers; where each outer layer comprises polyethylene; two tie layers; where each tie layer comprises a crystalline block composite; where each tie layer has a first face and a second face that are opposed to each other, and where the first face of each tie layer contacts at least one outer layer; and a core layer; where the core layer comprises a polypropylene; where the second

face of each tie layer contacts the core layer; and where the core layer has a thicknesses that is greater than 50% of the total thickness of the multilayer film.

[0005a] In another aspect, there is provided an article comprising the multilayer film as defined herein.

[0006] ~~Disclosed herein too~~In another aspect, there is provided a method comprising coextruding a multilayered film comprising two outer layers; where each outer layer comprises polyethylene; two tie layers; where each tie layer comprises a crystalline block composite; where each tie layer has a first face and a second face that are opposed to each other, and where the first face of each tie layer contacts at least one outer layer; and a core layer; where the core layer comprises a polypropylene; where the second face of each tie layer contacts the core layer; and where the core layer has a thicknesses that is greater than 50% of the total thickness of the multilayer film; and blowing the multilayered film.

BRIEF DESCRIPTION OF THE FIGURES

[0007] Figure 1 is a depiction of a prior art tube;

[0008] Figure 2 depicts an exemplary embodiment of the multilayered film; and

[0009] Figure 3 depicts an exemplary embodiment of a multilayered film that comprises two multilayered films of the Figure 2 that are coextruded or laminated together.

DETAILED DESCRIPTION

[0010] "Composition" and like terms mean a mixture of two or more materials, such as a polymer which is blended with other polymers or which contains additives, fillers, or the like. Included in compositions are pre-reaction, reaction and post-reaction mixtures the latter of which will include reaction products and by-products as well as unreacted components of the reaction mixture and decomposition products, if any, formed from the one or more components of the pre- reaction or reaction mixture.

[0011] "Blend", "polymer blend" and like terms mean a composition of two or more polymers. Such a blend may or may not be miscible. Such a blend may or may not be phase separated. Such a blend may or may not contain one or more domain configurations, as determined from transmission electron spectroscopy, light scattering, x-ray scattering, and any other method known in the art. Blends are not laminates, but one or more layers of a laminate may contain a blend.

[0012] "Polymer" means a compound prepared by polymerizing monomers, whether of the same or a different type. The generic term polymer thus embraces the term homopolymer, usually employed to refer to polymers prepared from only one type of monomer, and the term interpolymer as defined below. It also embraces all forms of