

受験番号 : 18IPC010

問 1

[Scope of Claims]

[Claim 1]

A method for producing an extruded styrene-based resin foam, comprising extrusion-foaming a styrene-based resin by using a blowing agent, wherein the styrene-based resin foam contains 1 to 6 parts by weight of a flame retardant relative to 100 parts by weight of the styrene-based resin, the flame retardant being (A) a bromine-containing flame retardant mixture of tetrabromobisphenol-A-bis(2,3-dibromo-2-methylpropyl ether) and tetrabromobisphenol-A-bis(2,3-dibromopropyl ether) or (B) a bromine-containing flame retardant mixture of tetrabromobisphenol-A-bis(2,3-dibromo-2-methylpropyl ether) and tris(2,3-dibromopropyl) isocyanurate,

the content of the tetrabromobisphenol-A-bis(2,3-dibromo-2-methylpropyl ether) in the bromine-containing flame retardant mixture is 25% by weight to 75% by weight, where the total amount of the bromine-containing flame retardant mixture is taken as 100% by weight, and

the foam containing cells having cell diameters of 0.2 mm or less and cells having cell diameters of more than 0.2 mm and 1 mm or less.

[Claim 2]

The method for producing an extruded styrene-based resin foam according to claim 1, wherein

a composition is prepared in advance by mixing the bromine-containing flame retardant mixture, a phosphorus-containing stabilizer, and other additives with the styrene-based resin and then melting the mixture with heating, and

the composition is fed to an extruder and again melted with heating.

問 2

[Background Art]

[0002] Recently, wearers of soft contact lenses (SCL) have been increasing. In general, when soft contact lenses are worn, the amount of oxygen supplied from the atmosphere decreases, which results in mitotic inhibition of corneal epithelial cells or thickening of the cornea in some cases. For this reason, soft contact lenses having increased oxygen permeability have been developed.

In view of this background, silicone hydrogel contact lenses have been developed recently as soft contact lenses having high oxygen permeability. By combining silicone with hydrogel, the silicone hydrogel contact lenses achieve oxygen permeability several times as high as those achieved by conventional hydrogel contact lenses. These soft contact lenses vary in terms of the presence or absence of ionicity, the degree of water content, etc, depending on their materials. Hence, it is important that an eye drop preparation to be applied to the eyes of wearers of soft contact lenses should be designed according to characteristics of the soft contact lenses.

問 3

## [Embodiment]

A barrier layer is made of a silicon compound. Specific examples of the silicon compound include silicon oxide, silicon nitride, silicon carbide, silicon oxynitride, etc. In the present invention, it is particularly preferable to use silicon nitride. The use of silicon nitride makes it possible to form the barrier layer as a dense film, and hence the barrier layer can be formed thinner with desired gas-barrier properties.

In addition, a silicon nitride film has a nature of being more colored and less transparent with the increase in thickness. Since the barrier layer is used in combination with a seal film and an adhesive layer described later in the present invention, the barrier layer can be thinner than a barrier layer in a conventional structure using only the barrier layer, and the barrier layer can have a good transparency. Hence, the barrier layer can be suitably applied to a top emission type organic EL element.

The thickness of the barrier layer is not particularly limited, as long as the barrier layer having such a thickness can protect an organic EL layer against oxygen, water vapor, and the like penetrating through the adhesive layer.

## 問 4

## [Example]

## (1) Preparation of Graft Copolymer

To a reaction vessel equipped with a thermometer, a stirrer, an nitrogen inlet, and a condenser, 25 parts by weight of polyvinyl butyral (polymerization degree: 1700, butyralization degree: 68.0% by mole, hydroxy group content: 30.8% by mole, and acetyl group content: 1.2% by mole), 25 parts by weight of isobutyl methacrylate, and 100 parts by weight of ethyl acetate were added, and the polyvinyl butyral was dissolved with stirring. Next, nitrogen gas was introduced into the reaction vessel for 30 minutes to purge the inside of the reaction vessel with nitrogen. Then, while the inside of the reaction vessel was being stirred, the temperature was raised to 75 degrees Celsius by heating. Thirty minutes later, a polymerization initiator solution obtained by diluting 0.5 parts by weight of t-hexyl peroxyphthalate as a polymerization initiator with 16 parts by weight of ethyl acetate was added dropwise to the reaction vessel over 5 hours. After that, the reaction was further allowed to proceed at 75 degrees Celsius for 3 hours. Subsequently, the reaction liquid was cooled to obtain a graft copolymer solution containing a graft copolymer and having a solid content of 30% by weight.