1,3,3a,4,5,9b-hexahydro-5-(tetrahydro-2,5-dioxo-3-furanyl)-naphtho[1,2-C]furan-1,3-dione. The tetracarboxylic dianhydride may be used either singly or in a combination of two or more thereof.

[0033]

The molecular weight of the polyimide resin of the present invention can be adjusted by using the tetracarboxylic acid component ~~and~~or the di-amine component for synthesis in an equimolar amount or using one of them in excess. It is also possible to use either the tetracarboxylic acid component or the di-amine component in excess and to cap an end of a polymer chain with an end cap compound such as an acid component or an amine component. A dicarboxylic acid or its anhydride is preferably used as the end cap compound for the acid component, and a monoamine is preferably used as the end cap compound for the amine component. At this time, it is preferred to adjust the acid equivalent of a tetracarboxylic acid component and the amine equivalent of a di-amine component including the end cap compound for the acid component or the amine component to be equimolar with each other.

[0034]

When the mole ratio is adjusted so that the tetracarboxylic acid component is excess or the di-amine component is excess, a dicarboxylic acid or an anhydride thereof and a monoamine, such as benzoic acid, phthalic anhydride,

Example 4	PA-6	100	-12	25	315
Comparative Example 1	PA-1	20	190	0	420
Comparative Example 2	PA-2	55	43	0	384

[0077]

As in Examples, when the content of the polysiloxane di-amine was adjusted to 60 mol% or more, the glass transition temperature of the polyimide resin was 30°C or lower and good adhesiveness was exhibited. In addition, the thermal decomposition onset temperature was 300°C or higher and high heat resistance was exhibited. In Comparative Examples, adhesiveness was not developed because the glass transition temperature was higher than 30°C.

[0078]

Example 5

A polyimide laminated glass substrate was obtained by performing the same operations as in Example 1 except that the polyamic acid resin solution was changed to PA-9.

[0079]

The adhesive force of the resulting polyimide laminated glass substrate, and the glass transition temperature and the thermal decomposition onset temperature of the polyimide resin were summarized in Table 4.

[0080]

Comparative Examples 3 and 4

Each of polyimide laminated glass substrates was obtained by performing the same operations as in Example 1 except that

the polyamic acid resin solution was changed as shown in Table 4.

[0081]

The adhesive force of each of the resulting polyimide laminated glass substrates, and the glass transition temperature and the thermal decomposition onset temperature of each of the polyimide resins were summarized in Table ~~3~~4.

[0082]

Comparative Examples 5 and 6

Due to the occurrence of gelation of each of the polyamic acid resin solutions (PA-10 and PA-11), measuring of adhesive force, glass transition temperature, and thermal decomposition onset temperature was not possible.

[0083]

[Table 4]

	Polyamic acid resin solution	n in general formula (1)	Glass transition temperature (°C)	Adhesive force (g/cm)	Thermal decomposition onset temperature (°C)
Example 2	PA-4	9	10	12	340
Example 5	PA-9	19	10	11	341
Comparative Example 3	PA-7	1	105	0	361
Comparative Example 4	PA-8	3	64	0	357
Comparative Example 5	PA-10	37	Not measurable		
Comparative Example 6	PA-11	57	Not measurable		

[0084]

In Examples in which n in general formula (1) was 5 to 30, the glass transition temperature of each of the polyimide