CHEMICAL RESISTANT POLYURETHANE ADHESIVE

Summary

In one embodiment, a pressure sensitive adhesive composition comprises a polyurethane polymer that comprises the reaction product of an aliphatic polyisocyanate component, a polyol component, and a functional acid containing compound. The polyol component has a total solubility parameter ranging from 10 to 14 $(cal/cm^3)^{1/2}$. The polyol component typically has hydrogen bonding ranging from 3.5 to 6. The polyol component typically comprises a polyester polyol, a polycaprolactone polyol, a polycarbonate polyol, or a combination thereof. The polyol component, aliphatic isocyanate component, or combination thereof comprises at least one six-membered (e.g. aromatic) ring structure. The polyol component, aliphatic isocyanate component, or combination thereof further comprises alkylene groups having at least 4, 5, or 6 carbon atoms.

In one aspect, there is provided a pressure sensitive adhesive composition comprising a polyurethane polymer, wherein the polyurethane polymer comprises the reaction product of an aliphatic polyisocyanate component comprising a polyisocyanate that is a liquid at 25°C; a polyol component comprising repeat units of an ortho- or meta- phthalate, and an alkylene group comprising at least 4 carbon atoms; and a functional acid containing compound: wherein the pressure sensitive adhesive has a G' less than 1 MPa at 25°C and a frequency of 1 hertz.

In one embodiment, the polyurethane polymer comprises the reaction product of an aliphatic polyisocyanate component, a polyol component, and a functional acid containing compound, that comprises polymerized units of an ortho- or meta- phthalate and an alkylene group comprising at least 4 carbon atoms.

What is claimed is:

1. A pressure sensitive adhesive composition comprising

a polyurethane polymer, wherein the polyurethane polymer comprises the reaction product of an aliphatic polyisocyanate component comprising a polyisocyanate that is a liquid at 25°C;

a polyol component comprising repeat units of

an ortho- or meta- phthalate, and

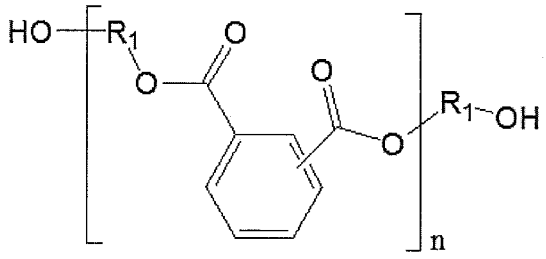
an alkylene group comprising at least 4 carbon atoms; and

a functional acid containing compound:

wherein the pressure sensitive adhesive has a G' less than 1 MPa at 25°C and a frequency of 1 hertz.

2. The pressure sensitive adhesive composition of claim 1 wherein aliphatic polyisocyanate component comprises an aliphatic cyclic polyisocyanate.

3. The pressure sensitive adhesive composition of claim 1 wherein the polyol component comprises a polymeric polyester polyol having the structure



wherein R_1 is independently an alkylene group comprising at least 4 carbon atoms,
n is at least 2, and
the ester group substituents are bonded to the ring at an ortho- or meta- position.

4. The pressure sensitive adhesive composition of claim 1 wherein the polyol component further comprises a multi-functional polyol having greater than two hydroxyl groups.

5. The pressure sensitive adhesive composition of claim 1, wherein the pressure sensitive adhesive composition is in the form of a foam.

6. A laminating tape comprising

a substrate; and

a layer of a pressure sensitive adhesive composition according to claim 1 disposed on a major surface of the substrate.

7. An illuminated display device comprising a component bonded with the pressure sensitive adhesive of claim 1.

8. An article comprising

a substrate; and

a primer layer comprising the polyurethane polymer of claim 1.