WHAT IS CLAIMED IS:

1. A method for temporary bonding workpiece, comprising:

performing a combining step, wherein an adhesive layer is formed on a surface of at least one substrate and/or at least one workpiece;

performing a bonding step, wherein the substrate and the workpiece are bonded by the adhesive layer;

performing a processing step, wherein the workpiece is processed; and

performing a debonding step, wherein the adhesive layer is irradiated with a laser so as to separate the workpiece from the substrate;

wherein the adhesive layer is formed by an adhesive, the adhesive comprises a polymer and a light absorbing material, a content of the polymer in a solid content of the adhesive is in a range of 50 wt% to 98 wt%, a content of the light absorbing material in the solid content of the adhesive is in a range of 2 wt% to 50 wt%, the polymer is polyimide or a copolymer of amic acid/imide, a content of a hydroxyl-containing unit of a skeleton of the polymer is in a range of 5 wt% to 45 wt%, a content of an aliphatic ether-containing unit of the skeleton of the polymer is in a range of 5 wt% to 40 wt%, and a cyclization ratio of the polymer is greater than or equal to 90%.

2. The method for temporary bonding workpiece of claim 1, wherein the combining step comprises:

performing a coating step, wherein the adhesive is coated on the surface of the substrate and/or the workpiece; and

performing a heating step, wherein the adhesive is heated so as to convert the adhesive into the adhesive layer.

3. The method for temporary bonding workpiece of claim 1, wherein the combining step comprises:

providing a composite film, wherein the composite film comprises a detachable substrate and an adhesive film, the adhesive film is disposed on a surface of the detachable substrate, and the adhesive film is obtained by the adhesive coated on the surface of the detachable substrate and then dried; and

performing a laminating step, wherein the surface of the substrate and/or the workpiece is contacted with the adhesive film of the composite film and heated so as to transfer the adhesive film to the surface of the substrate and/or the workpiece and convert into the adhesive layer.

4. The method for temporary bonding workpiece of claim 1, further comprises:

performing a dissolving step, wherein the adhesive layer remained on the workpiece is dissolved and removed by a cleaning solvent after the debonding step.

5. The method for temporary bonding workpiece of claim 4, wherein the solubility parameter of the cleaning solvent ranges from 9.6 to 12.8.

6. The method for temporary bonding workpiece of claim 1, wherein the workpiece is a chip, a wafer or a micro device for semiconductor manufacturing.

7. The method for temporary bonding workpiece of claim 1, wherein the aliphatic ether-containing unit is a poly aliphatic ether unit.

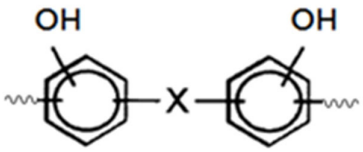
8. The method for temporary bonding workpiece of claim 1, wherein the light absorbing material is carbon black, titanium black, iron oxide, titanium nitride, an organic pigment or a dye.

9. An adhesive, comprising:

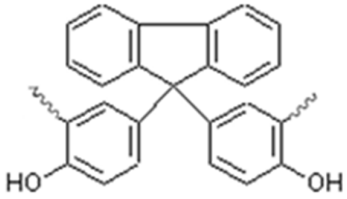
a polymer, wherein a content of the polymer in a solid content of the adhesive is in a range of 50 wt% to 98 wt%, the polymer is polyimide or a copolymer of amic acid/imide, a content of a hydroxyl-containing unit of a skeleton of the polymer is in a range of 5 wt% to 45 wt%, a content of an aliphatic ether-containing unit of the skeleton of the polymer is in a range of 5 wt% to 40 wt%, and a cyclization ratio of the polymer is greater than or equal to 90%; and

a light absorbing material, wherein a content of the light absorbing material in the solid content of the adhesive is in a range of 2 wt% to 50 wt%.

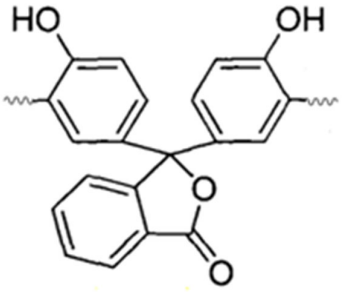
10. The adhesive of claim 9, wherein the hydroxyl-containing unit comprises a structure represented by formula (I-1), formula (I-2), formula (I-3), formula (I-4) or formula (I-5):



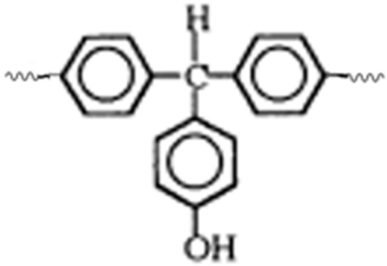
formula (I-1),



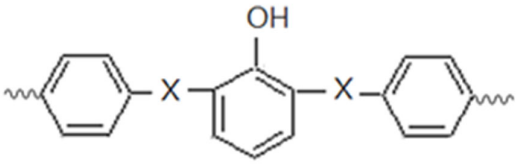
formula (I-2),



formula (I-3),



formula (I-4),



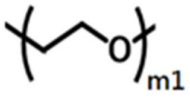
formula (I-5),

in formula (I-1) and formula (I-5), wherein each X is independently a single bond or a divalent organic group.

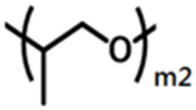
11. The adhesive of claim 10, wherein each X is independently the single bond, a alkylene group of 1 to 4 carbon atoms, -CO-, -COO-, -O-, -SO_2- or $C(CF_3)_2$.

12. The adhesive of claim 9, wherein the aliphatic ether-containing unit is a poly aliphatic ether unit.

13. The adhesive of claim 12, wherein the poly aliphatic ether unit comprises a segment represented by formula (II-1) or formula (II-2):



(II-1),



(II-2),

wherein m1 is an integer from 1 to 22, and m2 is an integer from 1 to 22.

14. The adhesive of claim 9, wherein the light absorbing material is carbon black, titanium black, iron oxide, titanium nitride, an organic pigment or a dye.