CLAIMS

1. A process for fabricating a donor substrate for transferring a piezoelectric layer to a carrier substrate, comprising the following successive steps:

(a) providing a piezoelectric substrate and a handle substrate,

(b) depositing a photopolymerizable adhesive layer on a main face of the handle substrate or of the piezoelectric substrate,

(c) bonding the piezoelectric substrate with the handle substrate via the adhesive layer to form a heterostructure,

(d) irradiating said heterostructure with a light flux in order to polymerize the adhesive layer,

(e) heat treating the irradiated heterostructure,

(f) thinning the piezoelectric substrate from the side thereof opposite the handle substrate, so as to form said donor substrate.

2. The process according to the preceding claim, further comprising a step (g) of chemical-mechanical polishing of the free surface of the thinned piezoelectric substrate.

3. The process according to one of the preceding claims, wherein the heat treatment (e) is carried out so as to increase the degree of crosslinking of the polymer in the photopolymerized adhesive layer and/or the stiffness of said photopolymerized adhesive layer.

4. The process according to one of the preceding claims, wherein the heat treatment (e) is carried out so that the Young's modulus of the adhesive layer after irradiation and heat treatment is between 3.5 GPa and 10 GPa, said Young's modulus being measured by nanoindentation.

5. The process according to one of the preceding claims, wherein the heat treatment (e) comprises the application of a temperature of between 90°C and 110°C, for a duration of between 1 hour and 12 hours, in a dinitrogen atmosphere.

6. The process according to one of the preceding claims, wherein the light flux is applied through the piezoelectric substrate.

7. The process according to one of the preceding claims, wherein the light flux has a wavelength between 200 nm and 500 nm.

8. The process according to one of the preceding claims, wherein the thickness of the photopolymerizable adhesive layer is between 1 µm and 50 µm and the irradiation energy received by said adhesive layer during the irradiation step is between 0.7 J/cm^2 and 10 J/cm^2.

9. The process according to one of the preceding claims, wherein the photopolymerizable adhesive layer is deposited by spin coating.

10. The process according to one of the preceding claims, wherein the photopolymerizable adhesive layer comprises an isocyanurate, acrylate or epoxy adhesive which can be crosslinked by ultraviolet radiation with or without a hardening agent.

11. The process according to one of the preceding claims, wherein the bonding step is carried out at a temperature between 10°C and 50°C and/or wherein the irradiation step is carried out at a temperature of between 10°C and 50°C.

12. A process for transferring a piezoelectric layer onto a carrier substrate, comprising:

- forming a donor substrate by implementing the process according to one any of the preceding claims,
- forming a weakened zone in the thinned piezoelectric substrate, so as to delimit the piezoelectric layer to be transferred,
- providing the carrier substrate,
- bonding said donor substrate to the carrier substrate, the piezoelectric layer to be transferred being located at the bonding interface,
- detaching the donor substrate along the weakened zone so as to transfer the piezoelectric layer to be transferred to the carrier substrate.

13. The process according to claim 12, comprising, prior to bonding, the formation of an oxide layer, or a nitride layer, or a layer comprising a combination of nitride and oxide, or a superposition of at least one oxide layer and one nitride layer on the carrier substrate.

14. The process according to either of Claims 12 or 13, wherein the formation of the weakened zone is formed by implanting atomic species into the thinned piezoelectric substrate.

15. The process according to one of Claims 12 to 14, wherein the handle substrate and the carrier substrate are fabricated from materials such that the difference in thermal expansion coefficient between the material of the handle substrate and the carrier substrate is less than or equal to 5%, preferably approximately equal to 0%.

16. A process for fabricating a bulk acoustic wave device comprising the deposition of electrodes on two opposite faces of a piezoelectric layer, characterized in that it comprises the fabrication of said piezoelectric layer by a process according to one of Claims 12 to 15.

17. A donor substrate for the transfer of a piezoelectric layer, consisting of a heterostructure comprising a piezoelectric substrate bonded to a handle substrate, said substrate being characterized in that it comprises, at the interface between the piezoelectric substrate and the handle substrate, a polymerized adhesive layer having a Young's modulus of between 3.5 GPa and 10 GPa.

18. The substrate according to claim 17, wherein the thickness of the polymerized adhesive layer is between 1 μm and 50 μm.

19. The substrate according to either of Claims 17 and 18, wherein the polymerized adhesive layer comprises an isocyanurate, acrylate or epoxy adhesive which can be crosslinked by ultraviolet radiation with or without a hardening agent.