CLAIMS

1. A process for transferring a working layer onto a support substrate, the process comprising the following steps:

   a) providing a donor substrate that comprises, starting from a main face, a donor layer formed from a piezoelectric material and a handle substrate, the donor layer lying on one face of the handle substrate;

   b) forming of a weakened zone, through the implantation of species in the donor layer, that is parallel to the main face and that, with the latter, delimits a working layer;

   c) joining the support substrate with the donor substrate in such a way as to interpose the donor layer between the handle substrate and the support substrate;

   d) subjecting to a heat treatment that comprises, in this order, a first phase and a second phase; the first phase, of a first duration, comprises an increase in temperature to a first temperature and is designed firstly to allow a maturation of defects, generated by the species, in the weakened zone and secondly to prevent initiation of a fracture in said weakened zone; the second phase, of a second duration, comprises a hold period at a second temperature lower than the first temperature and is designed to initiate a fracture along the weakened zone and thus to transfer the working layer onto the support substrate.

2. The process according to Claim 1, wherein step d) also comprises a strengthening phase preceding the first phase and performed at a temperature, termed the strengthening temperature, lower than the first temperature, the strengthening phase being intended to strengthen a bonding energy of an interface formed between the support substrate and the donor substrate during the performance of step c).

3. The process according to Claim 1 or 2, wherein the first phase comprises, in this order: an increase in temperature, a hold period at the first temperature, and a decrease in temperature to the second temperature.

4. The process according to one of Claims 1 to 3, wherein the first phase is adjusted according to the conditions of implantation of the species during the performance of step b).

5. The process according to one of Claims 1 to 4, wherein the relative difference between the coefficients of thermal expansion of the materials forming respectively the handle substrate and the support substrate is less than 10%.

6. The process according to one of Claims 1 to 5, wherein the handle substrate comprises a bulk substrate on one face of which lies an intermediate layer, the intermediate layer being interposed between the donor layer and the bulk substrate; advantageously, the intermediate layer comprises a polymeric material.

7. The process according to one of Claims 1 to 6, wherein the first temperature is less than 300°C, advantageously less than 250°C, even more advantageously less than 220°C.

8. The process according to one of Claims 1 to 7, wherein the second duration is less than 6 hours, advantageously less than 4 hours.

9. The process according to one of Claims 1 to 8, wherein the second temperature is less than 180°C, advantageously less than 170°C.

10. The process according to one of Claims 1 to 9, wherein the species comprise at least one element selected from: hydrogen ions, helium ions.

11. The process according to one of Claims 1 to 10, wherein the piezoelectric material comprises at least one element selected from: $LiTaO_3$, $LiNbO_3$, $LiAlO_3$, $BaTiO_3$, $PbZrTiO_3$, $KNbO_3$, $BaZrO_3$, $CaTiO_3$, $PbTiO_3$, $KTaO_3$.

12. The process according to one of Claims 1 to 11, wherein step c) of joining is preceded by a step of forming of a layer of dielectric material on the donor layer and/or on a front face of the support substrate.

13. The process according to one of Claims 1 to 12, wherein step c) of joining comprises a molecular bonding.