CLAIMS

1. A process for preparing a thin layer (1) comprising the following steps:
   - a weakening step (S2) comprising introduction of light species through a main face (2a) of a donor substrate (2), the weakening step (S2) aiming to form a weakened zone (3) in a central portion (2c) of the donor substrate (2) in order to define the thin layer (1) with the main face (2a) of the donor substrate (2), the weakened zone (3) not extending into a peripheral portion (2p) of the donor substrate (2);
   - a step of joining (S3) the main face (2a) of the donor substrate (2) to a receiver substrate (5) in order to form an assembly to be split, the central portion (2c) and the peripheral portion (2p) of the main face (2a) of the donor substrate (2) being brought into contact with a face of the receiver substrate (5);
   - a step of separating (S4) the assembly to be split, the separating step comprising a heat treatment resulting in initiation and propagation of a splitting wave in the weakened zone in order to free the thin layer (1) from the donor substrate (2) at the central portion (2c) thereof only, the splitting wave not propagating completely through the peripheral portion (2p) such that the donor substrate (2) and the receiver substrate (5) remain attached to one another at the peripheral portion (2p) of the donor substrate (2); and
   - a detaching step (S6), distinct from the separating step (S4) and applied after the separating step (S4), the detaching step (S6) comprising the treating of the assembly to be split in order to detach the peripheral portion (2p) of the donor substrate (2) from the receiver substrate (5) and thus transfer the thin layer (1) to the receiver substrate (5).

2. The process for preparing a thin layer (1) according to the preceding claim comprising a finishing step (S5), this step

comprising a heat treatment aiming to bring the assembly to be split to a temperature higher than the temperature of the heat treatment of the separating step (S4) in order to smooth the freed surface of the thin layer (1).

3. The process for preparing a thin layer (1) according to the preceding claim, wherein the finishing step (S5) is applied between the separating step (S4) and the detaching step (S6).

4. The process for preparing a thin layer (1) according to Claim 3, wherein the finishing step (S5) implements a heat treatment exposing the donor substrate (2) to a temperature lower than 1000°C, than 950°C, than 900°C, or than 600°C.

5. The process for preparing a thin layer (1) according to one of Claims 2 to 4, wherein the separating step (S4) and the finishing step (S5) are carried out in one and the same apparatus.

6. The process for preparing a thin layer (1) according to one of Claims 2 to 4, wherein the separating step (S4) and the finishing step (S5) are carried out in distinct apparatuses.

7. The process for preparing a thin layer (1) according to Claim 2, wherein the finishing step (S5) is applied after the detaching step (S6).

8. The process for preparing a thin layer (1) according to one of the preceding claims, wherein the donor substrate (2) is a wafer of circular shape and the peripheral portion (2p) is an annular portion, the width of which taken from the edge of the substrate is between 1 mm and 5 cm.

9. The process for preparing a thin layer (1) according to one of Claims 1 to 7, wherein the donor substrate (2) comprises a peripheral chamfer (2b) on its main-face (2a) side, and the

peripheral portion (2p) extends from the peripheral chamfer (2b) over a width of between 1 mm and 5 cm.

10. The process for preparing a thin layer (1) according to one of the preceding claims, wherein the light species are chosen from the list formed of hydrogen and helium.

11. The process for preparing a thin layer (1) according to one of the preceding claims, wherein the donor substrate (2) is made of monocrystalline silicon.

12. The process for preparing a thin layer (1) according to one of the preceding claims, wherein the separating step (S4) implements a heat treatment exposing the donor substrate (2) to a temperature of between 250°C and 500°C.

13. The process for preparing a thin layer (1) according to one of the preceding claims, wherein the detaching step is performed by chemical etching or by applying a mechanical force to separate the carrier substrate (5) and the donor substrate (2).