Claims

1. A method for transferring a thin film (10) onto a support substrate (2), comprising the following steps:

- providing a bonded structure (100) comprising a donor substrate (1) and the support substrate (2), assembled by direct bonding at the respective front faces (1a, 2a) thereof, following a bonding interface (3) extending along a main plane (x, y), the donor substrate (1) comprising a buried fragile plane (11) substantially parallel to the main plane and formed by a step of implanting light species including co-implantation of hydrogen ions at a first dose and a first implantation energy, and of helium ions at a second dose and a second implantation energy,

- applying a fracture heat treatment to the bonded structure (100) so as to induce spontaneous separation along the buried fragile plane (11), linked to the growth of microcracks in said plane (11) by thermal activation, the separation leading to the transfer of a thin film (10) from the donor substrate (1) onto the support substrate (2),

wherein the step of implanting light species further comprises localized implantation of hydrogen ions at a third dose and a third energy so as to form an overdosed local region (11b) in the buried fragile plane (11), the third dose corresponding to more than three times the first dose such that the overdosed local region constitutes a separation starting point.

2. The transfer method according to the preceding claim, wherein the third energy is less than the first energy.

3. The transfer method according to one of the preceding claims, wherein the local overdosed region (11b) is located in a central region of the donor substrate (1), along the main plane (x,y).

4. The transfer method according to one of the preceding claims, wherein the first dose is 1E16/cm^2 +/- 40%, the second dose is 1E16/cm^2 +/- 40%, and the third dose is between three times (exclusive) and seven times the first dose, preferentially of the order of four times the first dose.

5. The transfer method according to one of the preceding claims, wherein the local overdosed region has a surface area, in the main plane (x,y), of between 10 μm^2 and 2 cm^2.

6. The transfer method according to one of the preceding claims, wherein the donor substrate (1) and/or the support substrate (2) have an insulating layer (12), at least on the side of their respective front face (1a, 2a), which forms a buried insulating layer, adjacent to the bonding interface (3), in the bonded structure (100).

7. The transfer method according to claim 6, wherein the thin film (10) from the donor substrate (1) is made of monocrystalline silicon, and the support substrate (2) comprises monocrystalline silicon, to form a stacked SOI structure (110).