Claims

1. A method for bonding of a first contact area (3) of a first at least largely transparent substrate (1) to a second contact area (4) of a second at least largely transparent substrate (2), on at least one of the contact areas (3, 4) an oxide being used for bonding, from which an at least largely transparent interconnection layer (14) is formed with:

- an electrical conductivity of at least $10e^{1}$ S/cm (measurement: four point method, relative to temperature of 300K) and
- an optical transmittance greater than 0.8 for a wavelength range from 400 nm to 1500 nm on the first and second contact area (3, 4),

~~wherein the interconnection layer (14) is formed of a plurality of oxide layers (6, 9, 10, 11) after bonding, and wherein the plurality of oxide layers (6, 9, 10, 11) are interconnected vertically in an electrically conductive manner~~

- application of a first oxide layer (6) with the aforementioned electrical conductivity and the aforementioned optical transmittance to the first substrate (1),
- application of a second oxide layer (11) to the second substrate (2),
- plasma activating at least one of the substrates (1, 2), and
- bonding of the substrates (1, 2) at room temperature.

2. A method for producing a first substrate (1) with a first contact area (3) for bonding to a second contact area (4) of a second substrate (2), wherein ~~the~~ an upper surface of the first contact area (3) comprises a first oxide layer (6) with:

- an electrical conductivity of at least $10e^{1}$ S/cm (measurement: four point method, relative to temperature of 300K) and
- an optical transmittance greater than 0.8for a wavelength range from 400 nm to 1500 nm being applied to the first substrate (1),

~~wherein the lower surface of the second contact areas (4) is formed of a plurality of oxide layers (9, 10, 11), and wherein the plurality of oxide layers (6, 9, 10, 11) are interconnected vertically in an electrically conductive manner~~

- application of a first oxide layer (6) with the aforementioned electrical conductivity and the aforementioned optical transmittance to the first substrate (1),
- application of a second oxide layer (11) to the second substrate (2),
- plasma activating at least one of the substrates (1, 2), and
- bonding of the substrates (1, 2) at room temperature.

3. The method as claimed in one of the preceding claims, wherein the first contact area (3) is plasma-activated, especially prior to contact-making.

4. A method for producing a second substrate (2) with a second contact area (4) for bonding to a first contact area (3) of a first substrate (1), with the following steps, especially the following sequence:

- application of a second oxide layer (11) to the second substrate (2),
- application of a third oxide layer (10) to the second oxide layer (11), the third oxide layer (10) having an oxygen volume S_1 which is smaller than 70% of the maximum oxygen volume S_{max} of the third oxide layer (10) and
- application of a fourth oxide layer (9) to the third oxide layer (10),

~~wherein the upper surface of the first contact area (3) comprises a first oxide layer (6), and wherein the plurality of oxide layers (6, 9, 10, 11) are interconnected vertically in an electrically conductive manner~~

- application of a first oxide layer (6) with the aforementioned electrical conductivity and the aforementioned optical transmittance to the first substrate (1),
- application of a second oxide layer (11) to the second substrate (2),
- plasma activating at least one of the substrates (1, 2), and
- bonding of the substrates (1, 2) at room temperature.

5. The method as claimed in one of the preceding claims, wherein the oxide or one or more of the oxide layers (6, 9, 10, 11) contain at least one of the following components, especially as doping:

- indium,
- tin,
- aluminum,
- zinc,
- gallium,
- fluorine or
- antimony.

6. The method as claimed in one of the preceding claims, wherein the oxide or one or more of the oxide layers (6, 9, 10, 11) are applied by one of the following methods:

- metal organic chemical vapor deposition,
- metal organic molecular beam deposition,
- spray pyrolysis,
- pulsed laser deposition or
- sputtering.