Claims

1. Process for the production of a permanent, electrically conductive connection between a first surface comprising metallic and non-metallic regions of a first substrate and a second surface comprising metallic and non-metallic regions of a second substrate with the following method steps:

- Conditioning of the first and/or second surface in such a way that in a connection of the surfaces a permanent, electrically conductive connection - produced at least primarily by substitution diffusion between metal ions and/or metal atoms of the metallic regions of the surfaces – is produced, wherein the conditioning of the metallic regions of the first and second surfaces is effected by producing near surface layers with surface defects produced by implanting gas ions and/or by application of metallic nanoparticles,
- alignment and bonding of the first and second surfaces, whereby during the conditioning, alignment and bonding, a process temperature of at most 300°C is not exceeded.

2. Method according to Claim 1, wherein during the bonding of the first and second surfaces the non-metallic regions are contacted in a single step.

3. Method according to one of the preceding claims, wherein additionally hydrogen is implanted during conditioning of the first and second metal surfaces.

~~4. Method according to one of the preceding claims, wherein the conditioning of the metallic regions of the first and second surfaces is effected by producing near surface layers with surface defects produced by implanting gas ions and/or by application of metallic nanoparticles.~~

~~5~~4. Method according to one of the preceding claims, wherein the non-metallic regions consist of silicon dioxide or an organic insolator.

~~6~~5. Method according to one of the preceding claims, wherein the non-metallic regions are aligned or recessed with regard to the metallic regions.

~~7~~6. Method according to one of the preceding claims, wherein the conditioning comprises the optimization of the surface roughness of at least one of the metal surfaces.

7. Method according to claim 3, whereby argon ions and nitrogen ions are used for implanting gas ions, especially in combination with hydrogen ions.