

Device and Procedure for Depositing Metallic Elements on a Substrate of Interest in an Ultra-fast Mode

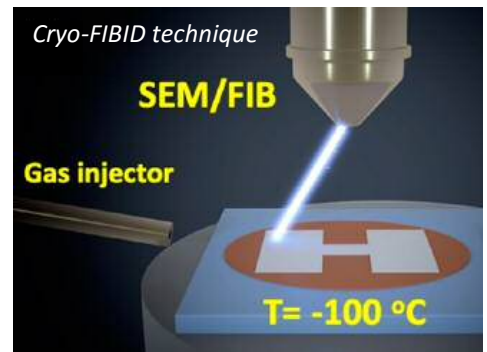
CSIC and the University of Zaragoza have developed a process to deposit new elements on a substrate of interest by means of a focused ion beam and a platform to cool the substrate of interest to cryogenic temperatures. This process also permits to mill defective elements that are located on it. The term "substrate of interest" refers to a support for an electronic device, an integrated circuit, or an optical lithography mask.

Industrial partners are being sought to collaborate through a patent licence agreement and/or R+D.

An offer for Patent Licensing

Ultra-fast deposition that also minimizes the appearance of defects

In the semiconductor industry, the companies use Focused Ion Beam (FIB) and Focused Ion Beam Induced Deposition (FIBID) techniques. The FIBID technique has two notable limitations: on the one hand, the growth rate of deposits at room temperature is very slow and, on the other, many defects are introduced in the work surface/substrate and/or in the grown material/deposit, associated to the use of ions. Therefore, it is necessary to develop fast procedures for element deposition using a focused ion beam that also minimize the appearance of defects. In the present invention the "deposited elements" can be physically united or can be isolated, can have any composition, can have any geometry.



Drawing of the Cryo-FIBID patented technique. The injected gas condenses on the substrate, being decomposed by the ion beam and forming a deposit.

Main innovations and advantages

- It is possible to increase the growth rate of conductive and non-conductive elements on the substrate of interest.
- Processing time is reduced by a factor of 600, thus obtaining significant financial savings.
- Damage to the substrate of interest is minimized.
- The implantation of ion beam atoms such as gallium atoms, amorphization effects and extrinsic doping caused by the gallium ion beam are minimized
- In addition, the appearance of defects is minimized.
- It is used to remove and repair electrical contacts on an integrated circuit or to repair faulty parts of an optical lithography mask.

Patent Status

Entry in national phases
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