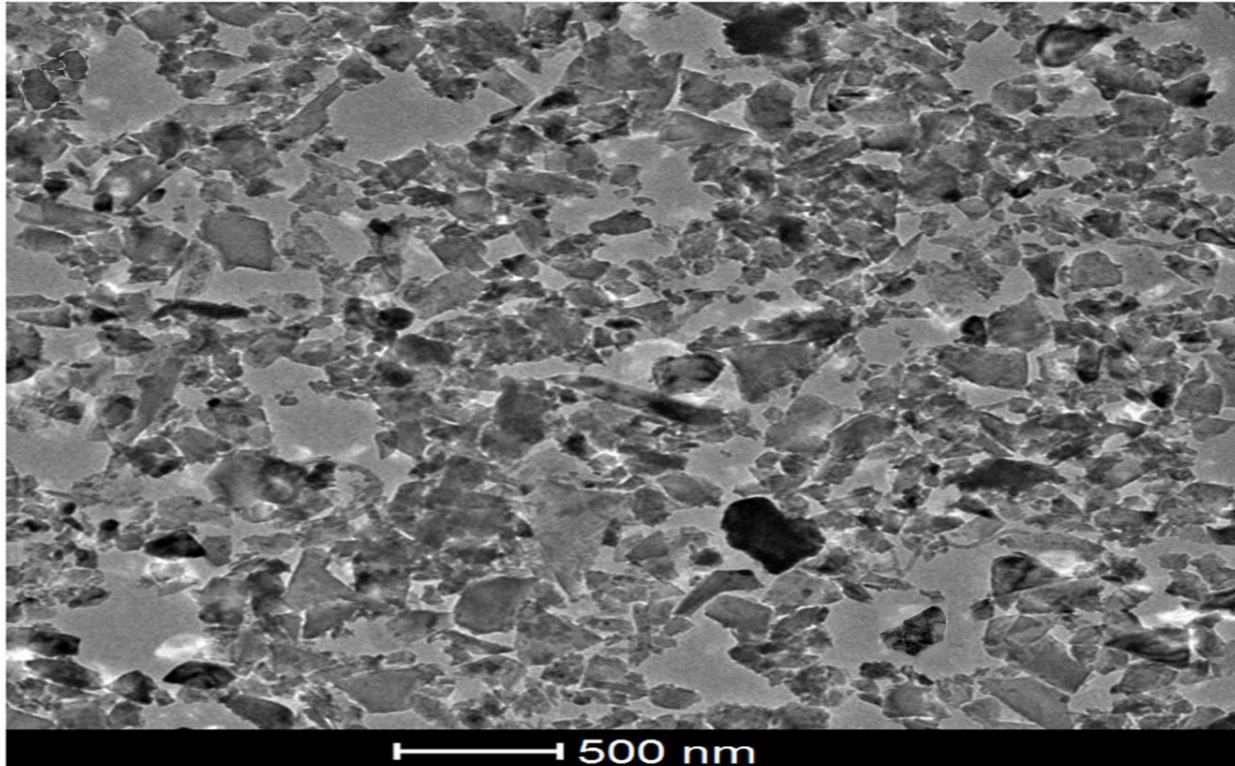


# HIGH-EFFICIENCY NANODIAMOND UV PHOTOCATHODES



## PRIORITY NUMBER:

102015000053374

## KEYWORDS:

Photocathode

Diamond

Ultraviolet

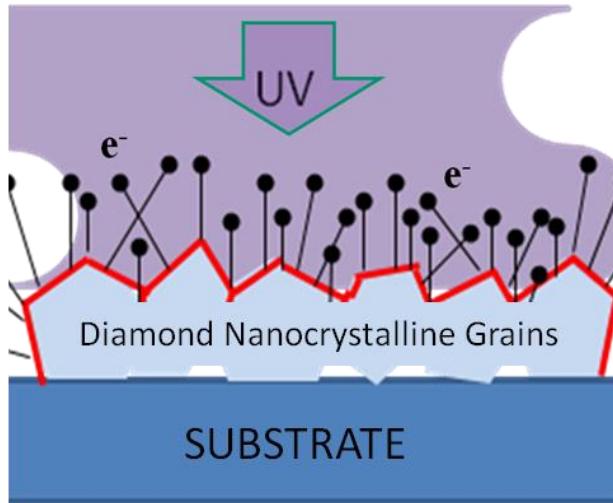
Quantum Efficiency

Hydrogenation

Layers of diamond nanoparticles (ND), deposited on a conductive substrate by means of the pulsed spray technique, allow the realization of photocathodes for UV radiation with high and stable quantum detection efficiency over the time. This technique overcomes the main drawbacks of the Chemical Vapor Deposition (CVD) technology like expensiveness and high temperatures. Additionally, ND particles are good candidates to replace the most common CsI, hygroscopic and unstable under intense photon flux.

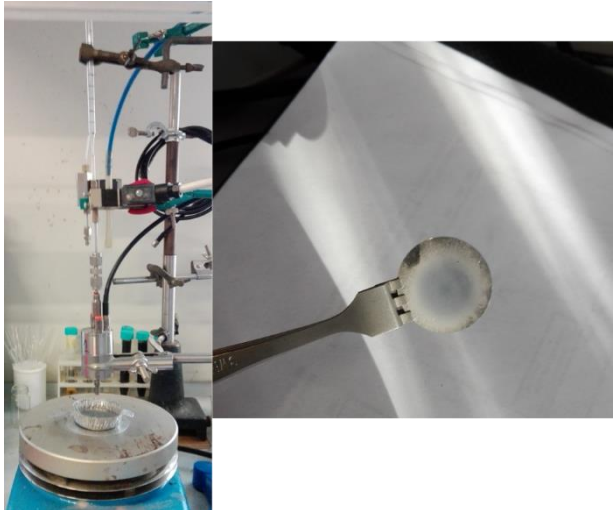


# HIGH-EFFICIENCY NANODIAMOND UV PHOTOCATHODES



## DESCRIPTION :

The invention relates on a highly efficient photocathode for ultraviolet radiation based nanodiamond layers deposited on a conductive substrate. By means of pulsed spray technique, the diamond particles, previously hydrogenated in an H<sub>2</sub> plasma and placed in a solution, are sprayed onto the conductive layer in order to create a uniform film. The use of this technique allows to increase the photoemission and to obtain quantum efficiency values not only higher than those obtainable by means of photocathodes realized with CVD technique, but also more stable over time. The diamond layer deposition process and parameter control is completely automated, even for the treatment of large areas; moreover, all the production steps are suitable for an industrial scale-up, since each used instrument is easily available on the market.



## ADVANTAGES:

- High and stable QE
- Better process reproducibility
- Low manufacture costs

## APPLICATIONS:

- Realization of photomultiplier components
- Detectors for environmental control of UVC radiations of natural and artificial sources
- Realization of high energy particle detectors