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## Characterization of CVD-diamonds for radiation detection

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We report for several tests carried on Chemical Vapour Deposition (CVD) diamonds to be used as ionizing radiation detectors. The unique properties of diamond makes it one of the most promising wide band-gap materials not only in the already established field of high luminosity X-ray detection for medical applications but also in modern high energy physics. CVD diamonds can be built in two different structures: polycrystalline with crystal size about 10-30% of thickness of grown samples, and single crystal. The production of sufficiently cheap diamond specimen with size of at least 5 mm diameter and thickness 50-1000  $\mu\text{m}$  with sufficient quality to tackle the requirements of detector applications is a hot technological challenge. Recent progress in growth of diamond samples of very high purity and high homogeneity along all their volume has opened perspectives to a new type of UV photosensors in order to work with large volume two phase liquid-Ar and/or liquid-Xe detectors, nowadays under design for next generation dark matter search. CVD diamond samples of both crystalline structures, supplied by Brevetti Bizz firm of San Bonifacio (VR, Italy) were investigated and the results of Current-Voltage characteristics, charge collection investigations for holes and electrons, and SEM/EDS analysis, in order to know the kind and the concentration of lattice impurities, are presented and discussed.

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