STORAGE PHOSPHORS: AN ALTERNATIVE FOR 2-DIMENSIONAL RADIATION IMAGING

J. Zimmermann and H. von Seggern

Institute of Materials- and Geo Science, Darmstadt University of Technology, Darmstadt, Germany

e-mail: zimmermann@e-mat.tu-darmstadt.de

Storage phosphors in form of image plates are used as an alternative to conventional two-dimensional x-ray detectors, such as scintillators coupled to a CCD device. In storage phosphors electrons and holes are generated by absorption of ionizing radiation and subsequently captured locally thus forming a latent image. The stored information can be read out by scanning with a focussed laser beam, whereby the trapped electrons get locally excited. In the next step the freed electrons recombine with nearby trapped holes leading to the emission of light, which is then recorded by a photomultiplier. The locally detected information is converted and displayed with the aid of a computer. The current understanding and state of the art in the field of storage phosphors will be presented. An introduction to storage and photostimulated luminescence process will be given. The nature of the storage centers and their physical generation will be discussed. Finally the most important storage phosphor materials will be introduced, applications and improvements of these materials will be discussed.