

UP-CONVERSION IN CANCER TISSUE DIAGNOSTICS

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Abstract -

Nanomaterials are used in medicine, electronics and materials science. There are many ways of using nanomaterials, mainly due to their opposite properties to coarse-crystalline analogs. An important role in nanotechnology, due to the application methods, is played by luminescent materials, e.g. organic dyes or quantum dots. Particularly important are also the high surface area to volume ratio of the particles, the minimum size that allows the membranes to penetrate or the size-dependent color transformation, and their self-organization.

Up-conversion materials are used in many fields, from electronics to medicine. Emission occurs within the limits of visible light and UV, and excitation mainly in the near-infrared spectrum. Up - conversion is observed for lanthanide ions due to the arrangement of their energy levels resulting from f - f electronic transitions. Organic compounds and transition metal ions are also able to form the UC process. Up-conversion nanomaterials, thanks to the infrared radiation excitation method, allow for stronger penetration of biological tissues without destroying them. They show high photochemical stability and a high anti-Stokes shift. The lack of background autofluorescence is also important, given the range of excitation used.

Keywords - Nonmaterials, Nanotechnology, Up-conversion Materials, Autofluorescence

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