**Looking for up-conversion from above 1000 nm**

Up-conversion (UC) of nanoparticles (NPs) doped with lanthanide ions (Ln3+) is under intense development in the last years what is connected with unique properties of this phenomenon and arising applications. Ultraviolet and visible luminescence of NPs under excitation with near-infrared can, in optoelectronics, lightening, security markers or solar cells.2 However, most of the on-going research in the field of UC is devoted to biomedical applications, e.g. in bioimaging, photodynamic therapy or photo-triggered drug release. Analytical assays and tests, as well as temperature sensors are other examples of the use of UC.

The most frequently investigated UC systems are these based on sensitization via Yb3+ ions at around 975 nm. The absorbed by Yb3+ ions excitation energy can be transferred to other Ln3+ ions, such as Ho3+, Er3+ or Tm3+, resulting in the emission of visible light. Ln3+ ions are also known from the absorption of radiation covering wavelengths from above 1000 nm. Thanks to the ground/excited state absorption (GSA/ESA) or energy transfer between Ln3+ ions (ETU) it is possible to obtain UC under excitation by laser light with longer than 1000 nm wavelengths, e.g. 1150, 1208 or 1532 nm. To achieve emission under the above-mentioned wavelengths, the properties of Ho3+, Er3+ or Tm3+ ions were utilized as dopants in SrF2 or NaYF4 fluoride NPs. The prepared NPs showed exceptional spectroscopic properties, with NIR to NIR or NIR to Vis UC.