Inorganic and hybrid materials are intensively investigated for different applications and especially in optics (bioimaging, sensors, filters, photocatalysis...).[1] Structuration of inorganic or hybrid materials at the nanoscale allows the design of complex multifunctional materials and combination of important properties (Optics, electronics, mechanics, catalysis, microfluidics..), thus becoming an important challenge in the scientific community. The use of nonlinear optical processes in stereolithography technics allows 3D control of reactions with submicronic resolution. Control of sol-gel reaction using 2-photon activated photobase or photoacid and combination with organic radical polymerization in a synergetic way will be discussed in the context of high resolution 3D printing. [2-4] Also, the use of functional hybrid nanoparticles allows 3D printing of ceramics with nanometric resolution. [5] Examples of applications in optics or microfluidics will illustrate this approach. This approach offers a wide possibility of compositions of materials for applications in energy storage, catalysis, photocatalysis, optics, sensors.

References


