

Nano-architecture with a femtosecond laser

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The nonlinear interaction between single crystals, glasses or polymers of transparent materials and femtosecond laser called non-linear multiphoton effect was studied. The various nano or microstructure changes caused by this effect has guided the internal modification inside materials, such as densification, valence reduction of active ions, new crystal precipitation and so on. Such an ultrashort pulse laser effect of transparent materials was useful for fabrication of photonic devices.

The femtosecond laser became also a candidate tool for dissecting and obtaining specific tissues or cells from biological samples. In this lecture, we report on the dissection of flammable (heat-sensitive) plant tissues (*Eucommia ulmoides* stem) and that of a transparent zebrafish embryo placed in water.

In view of our findings, the advantage of femtosecond laser combined with liquid crystal modulator is also introduced to make three-dimensional nano-architecture in materials.