Non-linear optical material



Safety: development of protecting agents

Phthalocyanines (Pcs) display both second- and third-order nonlinear optical (NLO) properties such as second harmonic generation (SGH), third harmonic generation (THG) and optical limiting (OL). These molecules can thus be used for protection of optical elements (e.g. eyes) against damage by exposure to sudden high intensity light. OL is a nonlinear effect consisting of a decrease in the transmittance of NLO material (such as Pc) under high-intensity illumination. Thus the transmission of the optical limiter (Pc) is high at normal intensities and low for intense beams.

Phthalocyanines containing In and Ge central metals exhibit good NLO properties. These phthalocyanines are being synthesized in our laboratory and characterized.

It has been reported that NLO properties of phthalocyanines are enhanced by fabrication of nanoparticles from phthalocyanines. Pc nanoparticles are readily synthesized using methods which includes microwave irradiation. The nanoparticles thus formed have to be characterized using AFM, since again the size and morphology are important.