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Ultrasonic Assisted Fabrication of Metal Nanoparticles by Laser Ablation in Liquid XIN HU, MARDIANSYAH MARDIS, WAHYU DIONO, NORIHARU TAKADA, HIDEKI KANDA, MOTONOBU GOTO, Nagoya University, GOTO TEAM — Laser ablation in liquid (LAL) is known to be a promising method for synthesizing metal nanoparticles. Here, gold and silver nanoparticles were fabricated by ultrasonic-assisted LAL. Gold and silver plates were ablated by using a Nd: YAG laser with a wavelength of 532 nm and energy of 26.4 J/cm2 in distilled water in the presence and absence of the ultrasonic field. The fabricated nanoparticles colloidal solution was analyzed with UV-vis spectrometer, transmission electron microscope (TEM) with energy dispersive X-ray spectroscopy (EDS) and zeta potential measurement. The craters on the silver plates were analyzed by scanning transmission electron microscope (SEM), laser microscope and MATLAB to observe the morphology and calculate the volume to obtain the concentration of fabricated nanoparticles solution. The optical emission was observed to study the characteristics of the laser. The results showed that ultrasonic-assisted LAL has considerable potential in fabricating superior metal nanoparticles.

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