Poster

COLLOIDAL GOLD NANOPARTICLES PRODUCTION BY LASER ABLATION IN LIQUIDS

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The colloidal metallic nanoparticles are of great interest due to their plasmon resonances [1,2], which make them suitable for a large range of applications specially in the production of nanostructured materials with tailor made properties to be used in the field of medicine[6], energy technology (fuel cells and solar cells), in information technology (new memories and processors) and in environmental technology (materials cycles and disposal).

The production of nanomaterials by physical methods, in the last decade, started to represent an alternative to the chemical ones, which could be inconvenient for certain applications owing to the contamination of the resulted nanomaterials. Another important advantage of the physical metods is the possibility of a better control over the growth environment.

We present the production of gold colloidal nanoparticles by pulsed laser ablation [3] using the fundamental (1064nm) and the second harmonic (532nm) of an Nd-YAG laser with 25ps pulse length, 10Hz repetition rate and a maximal energy of 100mJ/pulse, in water, Figure 2 and 3, aqueous solution of pamam dendrimer, Figure 1, and aqueous solution of sodium dodecyl sulfate [4].

For the characterisation of the produced colloidal nanoparticles we employ the on-line monitoring of the transmited and scattered light, the off-line TEM analysis and absorption spectra. The use of LIBD is a future project for the determination of the colloidal nanoparticles size distribution and number density [5].

Our aim is to succeed in controlling the size of the nanoparticles and their size distribution and in estimating their number concentration in the colloidal solution.

References:

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Figures:

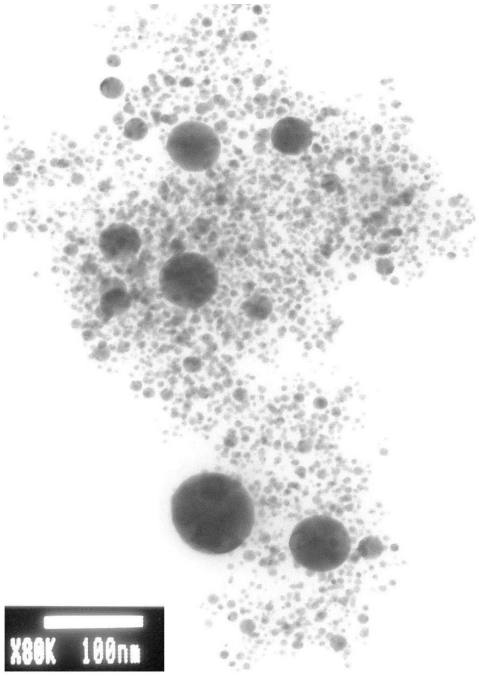

Fig.1. TEM image of gold nanoparticles in dendrimer aqueous solution.

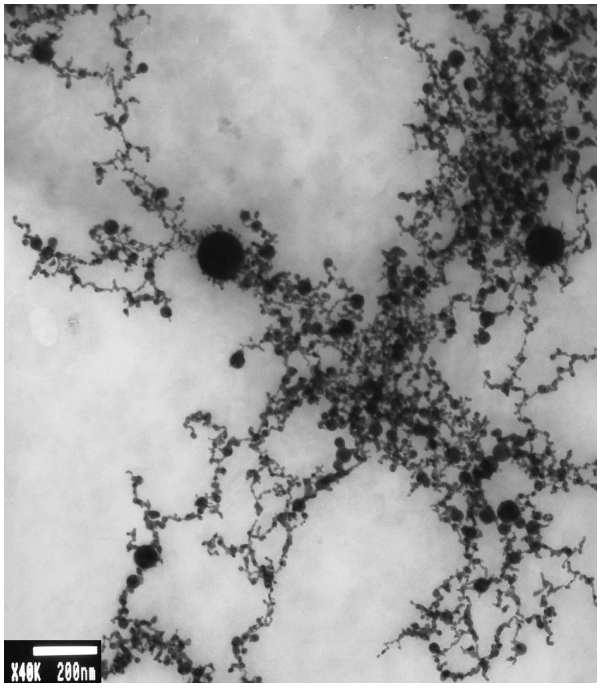

Fig.2. TEM image of gold nanoparticles in water after 24 hours.

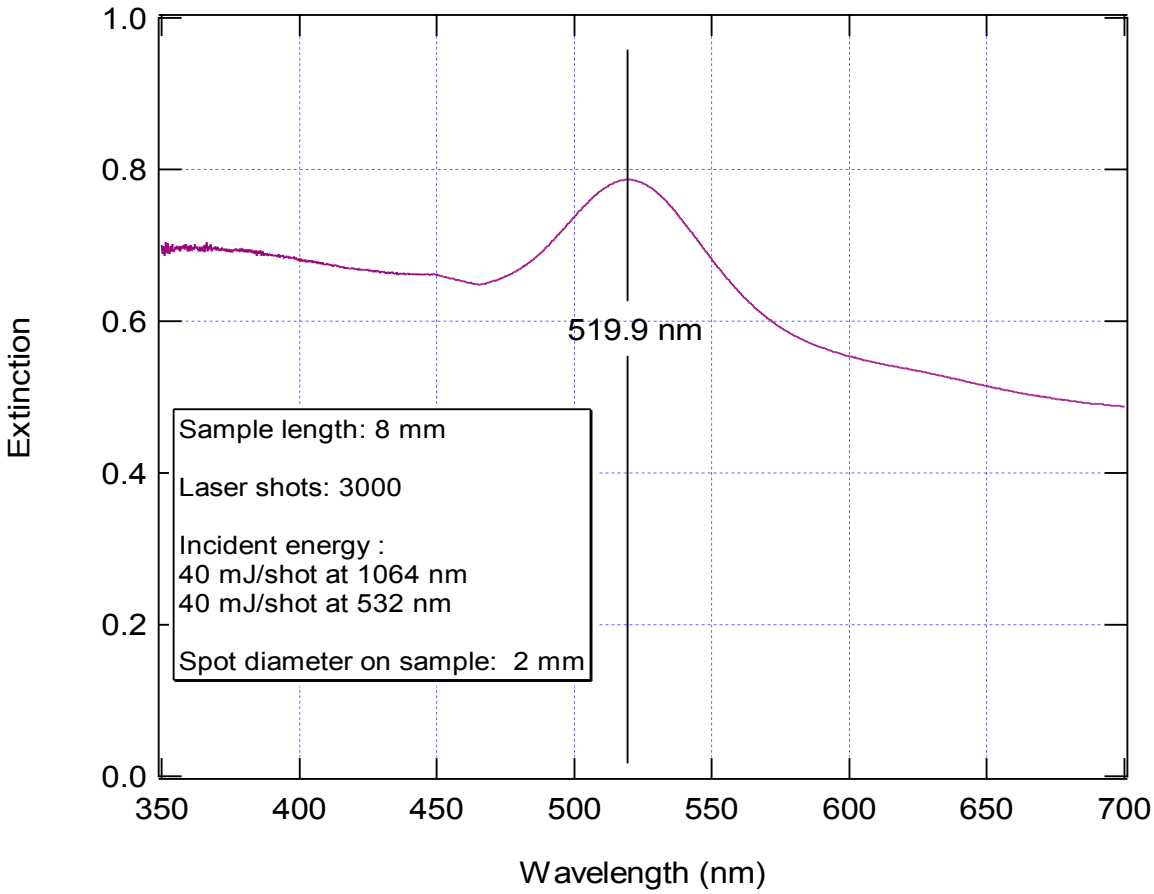

Fig.3. Extinction spectra of colloidal solution of gold nanoparticles in water.