

## INVITED TALK

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**FORMATION OF Fe, Pt and (Pt@Fe) ULTRA FINE METAL NANOPARTICLES IN DIFFERENT SOLUTION POLARITY PREPARED BY Nd-YAG PULSED LASER**Sabah M. Thahab<sup>1,2,\*</sup>, Abbas H. Abo Nasria<sup>3</sup>, Saja Hussain<sup>3</sup><sup>1</sup>*Nanotechnology and Advanced Materials Research Unit (NAMRU), Faculty of Engineering, University of Kufa, Najaf, IRAQ.*<sup>2</sup>*Electronics and Communication Department, Faculty of Engineering, University of Kufa, Najaf, IRAQ.**(E-mail: [sabah.alabboodi@uokufa.edu.iq](mailto:sabah.alabboodi@uokufa.edu.iq))*<sup>3</sup>*Physics Department, College of Science, University of Kufa, Najaf, IRAQ.*  
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**ABSTRACT-** Iron (Fe), platinum (Pt) and (Pt@Fe) ultra fine (UF) nanoparticles (NPs) were synthesized by pulsed (Q-switched, 1064 doubled frequency-Nd:YAG). The laser ablation of Fe and Pt metal plates has been performed by immersing these metal plates in deionised water (DDW), ethanol alcohol and PVP polymer solvent. The pulsed laser ablation in liquids (PLAL) process performed with 100 pulse energy of 700 mJ and liquid depth is 5 mm. The formation efficiency of PLAL process was quantified in term of the absorption spectrum peaks. The absorption spectra Iron (Fe/FeO, Pt) in DDW shows a sharp and single peak around 280, 234 nm, respectively, indicates the production of pure and spherical Fe/FeO, Pt (UF) NPs with an average size in the range of (2-5) nm. There is a simultaneous possibility of on-line observation of the nanoparticles formation via measuring the variation in nanoparticles absorption at the peaks observed. Changing the way of the fluid environment is a simple and flexible way to control the size appropriation and strength of Fe and Pt and bimetals (Pt@Fe) colloidal nanoparticles.

**Keywords:** nanoparticles, absorption, Nd-YAG laser, laser ablation, Fe, Pt.