

## **ABSTRACT**

*Contrast agents are substances used to enhance images, including contrast agents on the CT-Scan. Ta<sub>2</sub>O<sub>5</sub> nanoparticles colloids were tested for their potential as an alternative contrast agent on CT-Scan because they have a higher X-ray attenuation coefficient and density than iodine. However, there is still a lack of research conducted in obtaining stable nanoparticles. Researchers also explored the effects of utilizing eco-friendly liquid media to maintain small sizes. In this study, tantalum pentoxide (Ta<sub>2</sub>O<sub>5</sub>) nanoparticle have been successfully synthesized using pulse laser ablation in liquid. The laser used was Nd:YAG with a wavelength of 1064 nm. The laser ablated the surface of the tantalum metal plate in different liquid media DIW and CMC. The formation of Ta<sub>2</sub>O<sub>5</sub> nanoparticle colloids is characterized by a color change from transparent to gray. The liquid media used affects the characteristics of the Ta<sub>2</sub>O<sub>5</sub> nanoparticles formed and their ability as contrast agents. Field Emission scanning electron microscope images of Ta<sub>2</sub>O<sub>5</sub> nanoparticle colloids produce a spherical shape in DIW undergoing agglomeration, namely small, medium, and large with a size distribution of 9 nm, 27 nm, and 125 nm, While in CMC it has a size distribution of 17 nm. The CT Number value of Ta<sub>2</sub>O<sub>5</sub> nanoparticle in CMC media is 3,04 times higher than iodine and 1,89 times higher than DIW. On the other hand, the CNR value of Ta<sub>2</sub>O<sub>5</sub> nanoparticles in CMC media is 1,85 times higher than iodine and 1,22 times higher than DIW. So that Ta<sub>2</sub>O<sub>5</sub> nanoparticle colloids have the potential to be used as alternative contrast agents on CT-Scan machines*

**Keywords:** *Ta<sub>2</sub>O<sub>5</sub> nanoparticle colloids, pulse laser ablation in liquid, contrast agent.*