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HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH : JURNAL ILMIAH**

Judul Karya Ilmiah (Artikel) : The Role of Laser Irradiance, Pulse Repetition Rate, and Liquid Media in the Synthesis of Gold Nanoparticles by the Laser Ablation Method Using An Nd:YAG Laser 1064 nm at Low Energy

Jumlah Penulis Status : 3 orang

Pengusul Identitas : Penulis pertama/ ~~Penulis ke-~~ / ~~Penulis Korespondensi~~ **

Jurnal Ilmiah : a. Nama Jurnal : International Journal of Technology
 b. Nomor ISSN : 2086-9614
 c. Volume, Nomor, Bulan, Tahun : Vol. 10, No. 5, Oktober 2019
 d. Penerbit : Faculty of Engineering Universitas Indonesia
 e. DOI artikel (jika ada) : 10.14716/ijtech.v10i5.1953
 f. Alamat web jurnal : <https://ijtech.eng.ui.ac.id/article/view/1953>
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Nilai untuk Pengusul : (60% x 36,55) = 21,93			

Semarang, 24 Februari 2021

Reviewer 1



Prof. Dr. Suryono, S.Si., M.Si.
 NIP. 197306301998021001
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Reviewer 2



Dr. Eng. Eko Hidayanto, S.Si., M.Si.
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Reviewer 1



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Bidang Ilmu: Fakultas Sains dan Matematika

**LEMBAR
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d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	12			11,1
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2. Ruang lingkup dan kedalaman pembahasan:

Paper ini membahas tentang Sintesis nanopartikel emas dengan kemurnian tinggi dan distribusi ukuran sempit untuk aplikasi di bidang medis dengan metode ablasi laser pulsa menggunakan laser Nd:YAG pada energi rendah 30 mJ.

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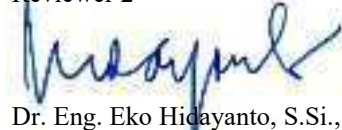
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Semarang, 03 Juli 2021

Reviewer 2



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NIP. 197301031998021001

Unit Kerja : Fisika

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The role of laser irradiance, pulse repetition rate, and liquid media in the synthesis of gold nanoparticles by the laser ablation method using an Nd: Yag laser 1064 nm at low energy

Khumaeni A. ✉, Sutanto H., Budi W.S.

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Department of Physics, Faculty of Science and Mathematics, Diponegoro University, Jl Prof. Soedharto, SH., Tembalang, Semarang, 50275, Indonesia

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Abstract

The synthesis of gold nanoparticles with high-purity and narrow size distribution is necessary for applications in the medical field. However, it is difficult to achieve this using chemical methods. In this study, the pulse laser ablation method using an Nd:YAG laser operated at a low-energy of 30 mJ has been successfully employed to produce gold nanoparticles with the required high purity and narrow size distribution. The role of laser irradiance, laser pulse repetition rate, and liquid media in the characteristics of the nanoparticles produced, such as shape and size distribution, were examined. In the experiment, an Nd:YAG laser beam (1064 nm, 7 ns) with a low energy of 30 mJ was irradiated on a high-purity gold plate (99.95%) immersed in a liquid medium. The results demonstrate that the average particle diameter and size distribution depended on certain parameters of the laser irradiance, the pulse repetition rate and the liquid medium used in the synthesis process. The diameters of the GNPs increased from 6.5 to 12.3 nm when the laser irradiance was increased from 12 to 20 GW/cm². They also increased from 12.3 to 20.7 nm when the pulse repetition rate was increased from 10 to 15 Hz. In addition, the particle diameters changed in line with different liquid media used; they were much smaller for purified water (diameter of 12.3 nm) compared to ethanol (diameter of 15.0 nm). However, the shape of the GNPs was the same for these parameters; the GNPs produced by the laser ablation method were spherical. By understanding the effects of these parameters on the characteristics of the GNPs produced by the laser ablation method using a low-energy Nd:YAG laser,

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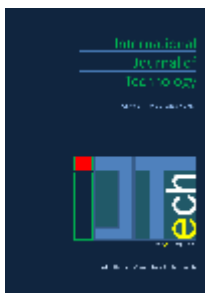
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Volume 10, Number 5



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Nyoman Suwartha, Mohammed Ali Berawi

Publication Date (Online):

Oct 30, 2019

DOI: <https://doi.org/10.14716/ijtech.v10i5.3670> (<https://doi.org/10.14716/ijtech.v10i5.3670>)

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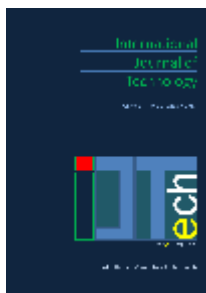
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JOURNAL ISSUE



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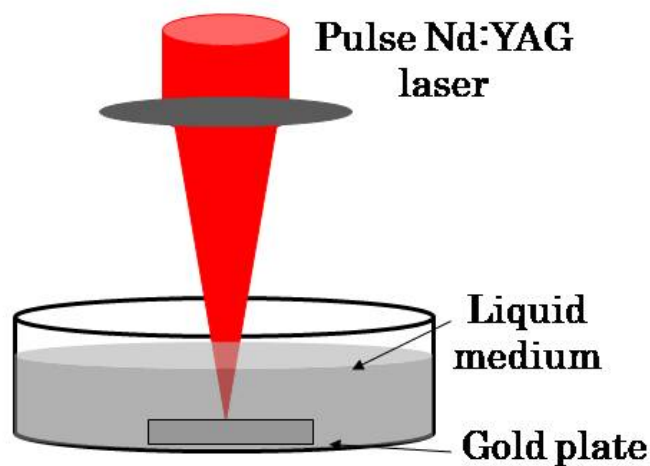
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Ali Khumaeni, Heri Sutanto, Wahyu Setia Budi

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Performance of Encased Silica-Manganese Slag Stone Columns in Soft Marine Clay

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Abstract

Stone columns are the most suitable and economical ground improvement technique for soft soils. Stone columns accelerate the consolidation process, thereby increase the stiffness of the soil. This increase may not be sufficient because of the less lateral confinement, which leads to excessive bulging. The strength of the composite soil can also be increased further by encasing the column with geotextile. In this paper, model tests were conducted on end-bearing stone columns with geotextile encasement and compared with the unreinforced (plain) stone columns. The stone columns were prepared by placing the silica-manganese slag, sand and were reinforced with geotextile with different encasement lengths of D , $2D$, $3D$, and $4D$ (D is the stone column diameter; i.e., 5 cm). The tests demonstrated that the engineering behavior of the soil was improved by introducing the silica-manganese slag (when compared with conventional stone columns) and also with encasement. Bulging can also be reduced by providing encasement beyond the zone of bulging.



Keywords

Bulging; Encasement; Geotextile; Marine clay; Silica-manganese slag; Stone column

Introduction

Due to development of infrastructure in metropolitan cities, suitable sites for construction have been reduced and caused a rise in land prices. Because of this problem, industries are looking for cheaper land for construction. As a result, some sites which were not used earlier due to low strength are now being used for construction. When these soils are loaded, they may experience failure due to excessive settlement. Greenwood (1970) was first to propose load transfer theory, settlement prediction, and estimation of ultimate bearing capacity. Hughes and Withers (1974) found that stone columns fail under compressive loads in general shear, bulging, and sliding. The load-carrying capacity of the columns is acquired via lateral confinement from the surrounding soils (Greenwood, 1970). While the stone columns improve soft soil, sufficient load-carrying capacity may not be achieved because of the less lateral confinement. To overcome this situation, geosynthetic material can be used for encasing stone columns. This is the most popularly used method.

Many researchers have used geosynthetic material as encasement for stone columns to improve soft soils. Murugesan and Rajagopal (2009; 2010), Gniel and Bouazza (2009), Samadhiya et al. (2009), and Hasan and Samadhiya (2016) studied the behavior of geosynthetic/geogrid-encased stone columns and found that the stiffness of soft soil can be improved by increasing the encasement length. Malarvizhi and Ilamparuthi (2004) reported that settlement can be reduced by providing the encasement by increasing the stiffness of the stone column. Murugesan and Rajagopal (2009) studied geosynthetic-encased stone column performance and found that the pressure settlement response showed linear behavior.

Malarvizhi and Ilamparuthi (2004; 2007) and Ali et al. (2011) studied the effect of length to diameter ratio (L/D) and found that the load-carrying capacity was increased by increasing the L/D ratio whereas the influence is much less in floating columns (Malarvizhi & Ilamparuthi, 2004). The bearing capacity of composite soil increases with column length, but the increase is not significant when the length exceeds beyond six times the column diameter (Ali et al., 2011). Samadhiya et al. (2009), Murugesan and Rajagopal (2010), Ali et al. (2011), and Hasan and Samadhiya (2016) conducted tests on stone columns of different diameters and concluded that the stiffness of the soil increases with a decrease in the diameter of the column. This is because of the higher confining stresses mobilized on smaller diameter columns. Fattah et al. (2016) studied the behavior of stone columns in embankments and concluded that the Stress Concentration Ratio (SCR; the ratio of the stresses in the column to the surrounding soil) increases gradually with increasing L/D ratio.

Dheerendra Babu et al. (2010) conducted experiments on stone columns reinforced with vertical nails placed along the circumference and found that the circumferential nails enhanced the stone column performance. Furthermore, the behavior of composite ground was improved with the number of nails. They also found that in order to enhance the stone column performance significantly, the depth of embedment of nails required was $3D$ to $4D$. Fattah & Majeed (2012a) studied the behavior of capped stone columns encased with geogrid by the finite element method and found that the capped stone column increased the bearing improvement ratio ($q_{\text{treated}}/q_{\text{untreated}}$) and decreased the settlement for all L/D ratios. The bearing improvement ratio also increased with the thickness of the cap, up to 0.4 times the footing diameter.

Samadhiya et al. (2009) and Hasan and Samadhiya (2016) studied the lateral reinforcement of geogrid strips by varying the vertical spacing and concluded that the load intensity was increased by decreasing the spacing. The strength of granular pile was increased by increasing the length of reinforcement to a depth of three times the diameter and no further increment was observed. Basu et al. (2016) worked with fiber-reinforced stone columns and found that the diameter of bulging can be decreased by increase the length and the fiber content. The depth of maximum bulging from the surface also decreased, but the total length of bulging was increased. Prasad and Satyanarayana (2016) studied the behavior of geotextile-reinforced stone columns by placing the reinforcement laterally at different spacings and found that the load-carrying capacity increased with the decrease in spacing.

Ambily and Gandhi (2004) carried out experimental studies by loading stone columns on their area alone and found that the failure occurred in the form of bulging of the stone column at a depth of about $0.5D$ to $1.0D$ below the surface. When the load was applied to the tank wall, the load/settlement behavior was linear and the failure did not take place. Fattah & Majeed (2012b) studied the geogrid-encased floating stone columns and found that the maximum lateral displacement occurred at an effective encasement length ratio (length of geogrid encasement along the stone column/total stone column length) of 0.6. Gniel & Bouazza (2009) carried out

Literature Review of Lean Manufacturing in Small and Medium-sized Enterprises

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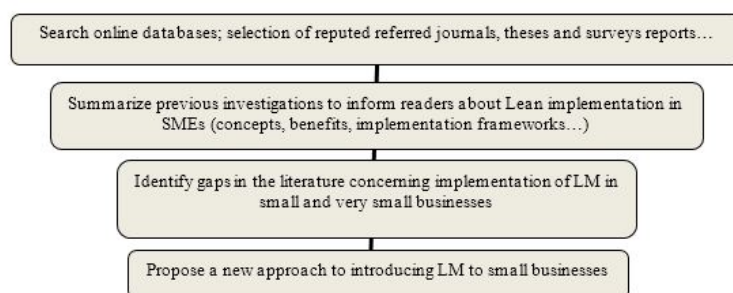
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Abstract

Small and medium-sized enterprises (SMEs) represent an important component of the economy in both developed and developing countries. Nowadays, the competitive industrial environment is encouraging these companies to redesign their manufacturing practices. Lean manufacturing (LM) has been widely implemented in several industries and has been shown to have had a positive impact on the performance and development of companies. This review aims to examine this impact on the performance of manufacturing companies, to emphasize the recent progress of LM amongst SMEs worldwide, and to show that most successful LM initiatives are those implemented in SMEs and large companies. However, very small businesses (VSBs) are struggling to introduce LM into their management systems. A new approach has been developed to establish a new lean implementation framework that could be adapted to the specific context of VSBs.



Keywords

Benefits; Lean implementation; Lean manufacturing; SMEs; Very small businesses

Introduction

Small and medium-sized enterprises (SMEs) play a major role in international economies and represent a vital component of economic growth in emerging ones. Therefore, SMEs are considered as one of the main contributors to GDP and employment worldwide (Saleh & Ndubisi, 2006).

In Europe, SMEs employ 93 million people and generate 57% of the added value. Most SMEs (93%) are micro businesses employing fewer than ten employees (Muller et al., 2017). In Morocco, according to Moroccan Confederation of SME statistics, SMEs represent 95% of the economic fabric. Indeed, they are considered to be a vital source of wealth and job creation, constituting 40% of production and 31% of exports (CDVM, 2011). However, SMEs are presently struggling to maintain their competitiveness due to the high competition in the economic context. Therefore, they are concentrating on focusing their efforts on reducing costs and producing more customized products, in smaller batch sizes and with a short lead time. LM practices and techniques could help improve the performance of manufacturing companies, as well as reducing their costs.

LM is a set of techniques that aims to increase the creation of value and reduce all types of waste. The process was developed by Taiichi Ohno during the creation of the Toyota production system (TPS) in the 1950s (Rauch et al., 2017). Many companies in different fields all over the world have launched initiatives and projects to introduce Lean practices (Narayanamurthy et al., 2018; Bajjou & Chafi, 2018a; Bajjou & Chafi, 2018b). Typical lean methods have been applied for many years in order to structure lean production process in certain multinational companies; initially specialized ones in the automotive industry, but later ones in other industrial sectors, including smaller companies (Rauch et al., 2017).

According to previous research based on different contexts, SMEs have also successfully introduced Lean practices in Europe (Ulewicz & Kuc?ba, 2016; Antosz & Stadnicka, 2017); in Malaysia (Rose et al., 2017); Brazil (Ferreira et al., 2016); India (Verma & Sharma, 2017; Gandhi et al., 2018); Morocco (Fakkous et al., 2015; Belhadi et al., 2016; Bajjou & Chafi, 2018c), and Italy (Matt & Rauch, 2013; Rauch et al., 2017), amongst to the countries.

This review paper aims to highlight the positive impact of Lean on company performance, as reflected in operational, strategic, administrative and human aspects. The paper also indicates that LM has proved its efficiency in performance improvement in large companies, as well as SMEs. In order to develop a new Lean strategy which could be suitable for very small businesses (VSBs), we suggest an approach to the design of a new framework for Lean implementation adapted to small company characteristics.

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