GREEN SYNTHESIS OF TIO_2 USING ALOE VERA FOR PHOTODEGRADATION IN SASIRANGAN WASTE

SKRIPSI

Untuk memenuhi persyaratan
dalam menyelesaikan Strata-1 Fisika

Oleh :
NOOR ASYIAH
2111014320003

PROGRAM STUDI S-1 FISIKA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS LAMBUNG MANGKURAT
BANJARBARU
MARET 2025

LEMBAR PENGESAHAN

SKRIPSI

GREEN SYNTHESIS OF TIO_2 USING ALOE VERA FOR PHOTODEGRADATION IN SASIRANGAN WASTE

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KATA PENGANTAR

Puji dan syukur penulis ucapkan ke hadirat Allah SWT atas segala rahmat dan karunia-Nya serta sholawat dan salam kepada Nabi Muhammad SAW sehingga penulisan dapat menyelesaikan jurnal yang berjudul "*Green Synthesis Of* TiO_2 *Using Aloe Vera For Photodegradation In Sasirangan Waste*" dengan baik. Penulisan jurnal ini merupakan syarat dalam menyelesaikan pendidikan program Strata-1 Fisika, Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Lambung Mangkurat.

Penulis menyadari bahwa penulisan jurnal ini tidak lepas dari bantuan berbagai pihak, oleh karena itu pada kesempatan ini penulis mengucapkan terima kasih yang sebesar-besarnya kepada :

1. Bapak Prof. Drs. Abdul Gafur, M.Si., M.Sc., Ph.D. selaku Dekan Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Lambung Mangkurat.
2. Ibu Dr. Nurlina, S.Si., M.Sc. selaku Ketua Program Studi S1 Fisika Fakultas Matematika dan Ilmu Pengetahuan Alam, Universitas Lambung Mangkurat.
3. Bapak Dr. Eka Suarso, S.Si, M.Si. selaku dosen Pembimbing Akademik yang selalu memberikan motivasi dan semangat dalam menjalani perkuliahan.
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8. Muliyawati dan Ahmad Ilmi selaku saudara kandung penulis yang selalu membersamai, membantu dan memberikan semangat selama berkuliah.
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10. Per-kasuhan fisika yang juga membersamai, memberikan motivasi dan semangat dalam menjalani perkuliahan.
11. Tim PKM-RE Fotio2alve yang telah membersamai dan membantu dalam penelitian dan penulisan jurnal.
12. Semua pihak yang tidak bisa disebutkan satu-persatu yang telah banyak memberikan dukungan baik moril maupun materil dalam penyelesaian jurnal ini.

Penulis juga menyadari bahwa jurnal ini masih jauh dari kata sempurna. Oleh karena itu, penulis mengharapkan adanya kritik dan saran yang sifatnya membangun dari semua pihak. Agar diperoleh kesempurnaan dalam pembuatan jurnal yang akan datang. Semoga jurnal ini dapat berguna bagi penulis pada khususnya dan bagi pembaca pada umumnya.

Banjarbaru, 13 Maret 2025

Noor Asyiah

SURAT PERNYATAAN

Dengan ini saya menyatakan bahwa dalam jurnal ini tidak terdapat karya yang pernah diajukan untuk memperoleh gelar kesarjanaan di suatu Perguruan Tinggi, dan sepanjang pengetahuan saya juga tidak terdapat karya atau pendapat yang pernah ditulis atau diterbitkan oleh orang lain, kecuali yang secara tertulis diacu dalam naskah ini dan disebutkan dalam daftar pustaka.

Banjarbaru, 13 Maret 2025

Yang Menyatakan,

Noor Asyiah

NIM. 2111014320003

KEMENTERIAN PENDIDIKAN TINGGI, SAINS DAN TEKNOLOGI
UNIVERSITAS LAMBUNG MANGKURAT
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
PROGRAM STUDI S1 FISIKA
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BERITA ACARA PENGESAHAN REKOGNISI SKRIPSI SEMESTER GANJIL TAHUN AKADEMIK 2024/2025 PROGRAM STUDI FISIKA FMIPA-ULM

Pada hari ini Kamis, 13 Maret 2025, telah dilaksanakan **pengesahan rekognisi skripsi** bagi mahasiswa berikut:

Nama	: Noor Asyiah
NIM	: 2111014320003
Judul Artikel	: Green Synthesis of TiO_2 Using Aloe Vera for Photodegradation in Sasirangan Waste
Jurnal	: Sinta 2
Status Publikasi	: Published

Mahasiswa tersebut telah memenuhi seluruh persyaratan akademik dalam **skema rekognisi skripsi melalui publikasi artikel ilmiah** dan **dinyatakan lulus rekognisi skripsi**. Dengan demikian, mahasiswa berhak memperoleh nilai skripsi sesuai ketentuan yang berlaku di Program Studi Fisika FMIPA ULM.

Berita acara ini disahkan oleh dosen pembimbing, sebagaimana tercantum di bawah ini :

No.	Nama Pembimbing	Tanda Tangan
1.	Dr. Suryajaya, S.Si., M.Sc.Tech. NIP. 197309201998031009	

Berdasarkan ketentuan yang telah ditetapkan dalam panduan akademik Program Studi Fisika FMIPA ULM, mahasiswa ini diberikan nilai sebesar ..... 90 ..... (A.).

Demikian berita acara ini dibuat sebagai bukti sah bahwa mahasiswa telah menyelesaikan rekognisi skripsi dan berhak mendapatkan nilai skripsi sesuai ketentuan yang berlaku.

Banjarbaru, 13 Maret 2025
Mengetahui,
Ketua Program Studi,

Dr. Nurlina, S.Si., M.Sc.
NIP. 19760414 200312 2 001

Dosen Pembimbing,

Dr. Suryajaya, S.Si., M.Sc.Tech.
NIP. 19730920 199803 1 009

LoA

Indonesian Physical Review
ISSN : 2615 - 1278 e-ISSN : 2614 7904

Letter of Acceptance (LoA)

No: 381/IPR-08/01/2025

Dear Noor Asyiah, *et.al.*,

We are pleased to inform you that, after the peer review, your paper:

Title	:	Green Synthesis of TiO2 Using Aloe Vera for Photodegradation in Sasirangan Waste
Authors	:	Noor Asyiah, Ahmad, Tarisa Ananda, Maulanie Muhaemina, Jannesa Tri Rosadi, Suryajaya, Maya Safitri.

has been accepted and will be published in Indonesian Physical Review Volume 08 Issue 01, January 2025. Thank You.

Mataram, November 17th, 2024

Sincerely,

Lily Maysari Angraini
Editor in Chief
Indonesian Physical Review

Form Review

Indonesian Physical Review ISSN : 2615 - 1278 e-ISSN : 2614 7904

Reff#: 381

Green Synthesis of TiO_2 Using Aloe Vera for Photodegradation In Sasirangan Waste

by Noor Asyiah, Ahmad, Tarisa Ananda, Maulanie Muhaemina, Jannesa Tri Rosadi, Suryajaya, Maya Safitri

Dear Noor Asyiah. et al.,

Thank you for submitting your manuscript titled "Green Synthesis of TiO_2 Using Aloe Vera for Photodegradation In Sasirangan Waste." We appreciate your efforts in exploring this novel idea.

However, after a preliminary review, we request you to address the following comments and provide a revised version along with clear and convincing arguments addressing the critiques.

Criticism:

The manuscript presents a study on the green synthesis of TiO_2 using Aloe Vera for the photodegradation of Sasirangan waste. This is an interesting and relevant topic, particularly in the field of environmental science and sustainable materials. The use of natural resources such as Aloe Vera for synthesizing TiO_2 nanoparticles is a significant approach that aligns with current trends in green chemistry. However, before proceeding to the peer review stage, several aspects of the manuscript need to be addressed to enhance its scientific quality and clarity.

The concept of using Aloe Vera for the green synthesis of TiO_2 is not entirely new. Several studies have explored similar approaches. Therefore, it is essential to clearly articulate what distinguishes this work from existing literature. The manuscript mentions the application to Sasirangan waste as a novel aspect, but further emphasis on how this application advances the field is needed. Additionally, the manuscript should provide a more detailed comparison with previous studies, highlighting the unique contributions of this work.

The methodology is generally well described; however, some details need clarification to ensure reproducibility. For example, the preparation process of the Aloe Vera extract and the conditions used for the synthesis should be more explicit. Additionally, the choice of pH variations and their specific impact on the synthesis process should be justified with references to relevant literature. The slip casting method used for thin-film deposition is mentioned, but the rationale behind choosing this particular method over others is not clearly explained. It would be beneficial to discuss why this method was selected and how it affects the quality and performance of the TiO_2 films.

The data presented, including FTIR, XRD, and SEM results, are informative but require more in-depth analysis. The manuscript should provide a more thorough discussion of how these results support the conclusions drawn. For example, the XRD results indicate the presence of

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the anatase phase, which is crucial for photocatalytic activity. However, the manuscript could benefit from a more detailed explanation of how the phase and crystallinity influence the overall performance of the material. The photodegradation results show a significant difference between the synthesized TiO_2 and commercial TiO_2. While this is a positive finding, the manuscript should explore the underlying reasons for this difference in more detail. Is it due to the particle size, surface area, or the presence of Aloe Vera-derived compounds? A more rigorous analysis would strengthen the manuscript.

The discussion section could be expanded to include a more comprehensive comparison with other studies in the field. This will help position the research within the broader scientific context and demonstrate its significance. The conclusion is succinct but could be more impactful by highlighting the broader implications of the findings. For example, the potential scalability of this green synthesis method and its applicability to other types of waste could be discussed.

The manuscript has potential and contributes to an important area of research in environmental science and materials chemistry. However, it requires significant revisions before it can be considered for peer review. The authors should address the points mentioned above to enhance the scientific rigor and clarity of the manuscript. Once these revisions are made, the manuscript may be suitable for further consideration in the peer review process.

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Indonesian Physical Review

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REVIEW NOTES

Manuscript ID:

No.	Object	Comments
1.	***Title***	In general, the title already represents the factual finding in the provided manuscript.
2.	***Abstract***	The abstract need to be re-structured to provide a concise overview of the key points on the research. Moreover, in the writing of "*This was confirmed by SEM.....*", it should refers to the previous sentences, otherwise, it should consistent to represent what the SEM given. Failed to do so, will lead to an ambiguity. To be noted, SEM never gives any phase confirmation, XRD does.
3.	***Introduction***	The introduction section showed some moderate part that should be fixed. (i) It is suggested to provide a solid structure, with a proper connection. It should be at least contains background or context, literature review, problem statement or research question, objectives or purpose, significance of the study. Out of these, should be placed at another section. Please refers to the last paragraph.
4.	***Methods (Optional)***	In this section, the author should notice the differences between synthesis and characterization. Please refers to the sentence No. 6.
5.	***Analysis and Discussion***	The author is suggested to provide a proper figure or images. The resolution should good enough and the size is well-fitted with the writing styles area. Providing a cropped images or figure i.e. cropping data plotting instead of providing the real plot, is strictly prohibited in the scientific or academic writing. Please refers to figure 6.
6.	***Conclusion***	Overall, the conclusion is concise and covers the essential findings but could elaborate further on future improvements. For example, the comparison between basic, acidic, and neutral conditions could benefit from quantitative data, and the relatively low photocatalytic activity for sasirangan waste

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		(4.5%) suggests room for improvement in specific applications.
7.	***Bibliography***	All are well structured.
8.	***Special Notes***	None.

SUBMISSION DECISION*

- ☐ ***Accepted (Publish without change)***
- ☐ ***Accepted with some revision by editorial board***
- ☑ ***Accepted with some revision by authors (I have no further need to review the manuscript)***
- ☐ ***Accepted after some revision by authors (Return to me on resubmittal)***
- ☐ ***Rejected/Send to another journal***

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P E D Putra, M. S., M. Sc.

24 Sept 2024

Indonesian Physical Review

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REVIEW NOTES

Manuscript ID:

No.	Object	Comments
1.	*Title*	Acceptable
2.	*Abstract*	Largely acceptable. Last sentence does not fit the flow.
3.	*Introduction*	Acceptable, but needs more information on why aloe vera is a good choice as the reducing agent as compared to other plants. Also, this section requires minor grammar corrections.
4.	*Methods (Optional)*	i) I recommend adding a washing step with ethanol, to aid in the removal of organic chemical fragments from the plant extract.
5.	*Analysis and Discussion*	i) On Page 104, please note the highlighted section. It is unclear which chemical component the author considers to be the primary contributor to TiO_2 synthesis ii) A magnified SEM visual of the spherical particles would be a valuable addition iii) Figures 9c, 10a, 10b and 10c show dubious data, where the absorbance of longer exposures is higher than short exposure times. This seems to be highly irregular. iv) If the data from Figures 9 & 10 is irregular, it casts a doubt on the calculations of Figure 11
6.	*Conclusion*	Acceptable
7.	*Bibliography*	Acceptable
8.	*Special Notes*	I recommend that the UV-Vis measurements should be repeated, and the data should be verified. If there is no change in the trend, then a reasonable explanation must be provided.

SUBMISSION DECISION*

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☐	***Accepted with some revision by authors (I have no further need to review the manuscript)***
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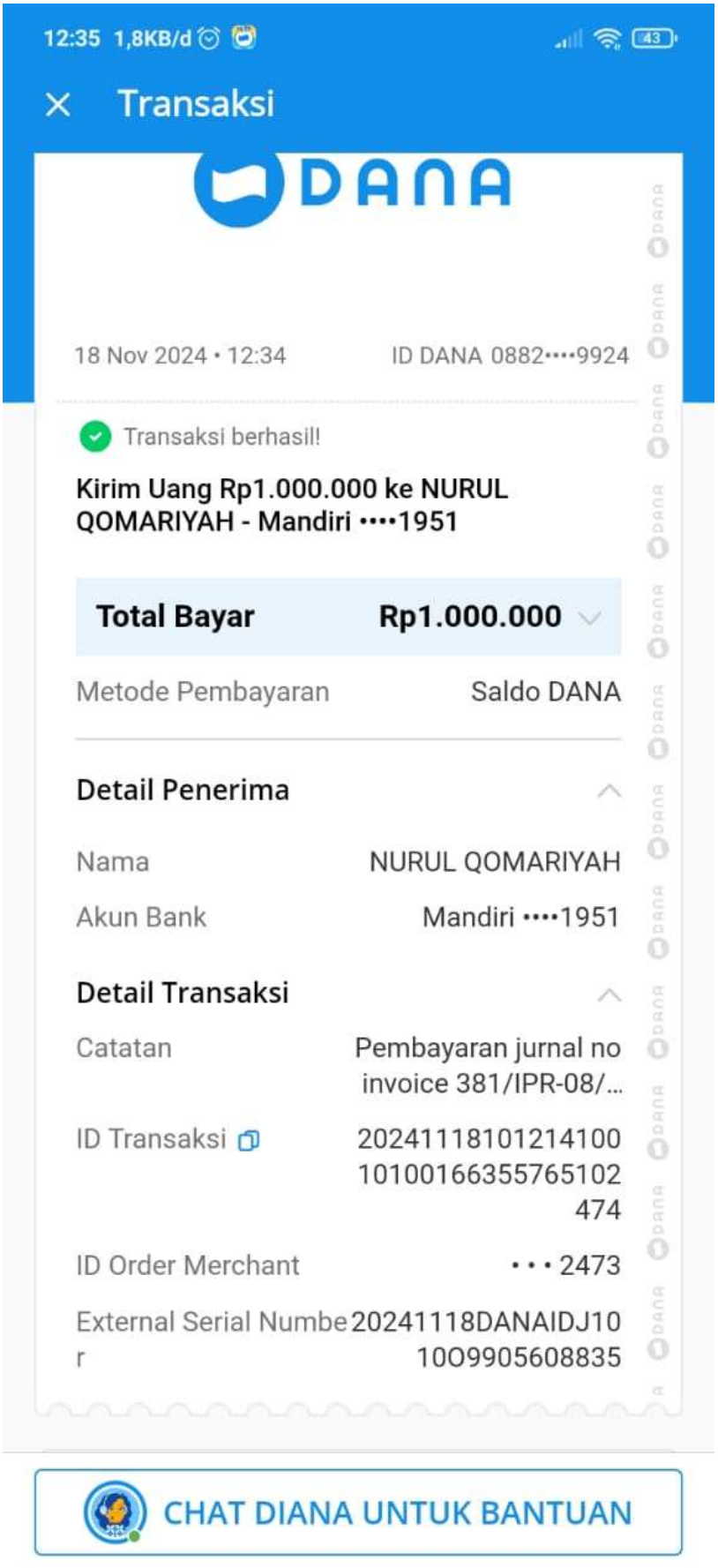
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