

Review Form 3

Journal Name:	Asian Journal of Advanced Research and Reports
Manuscript Number:	Ms_AJARR_125894
Title of the Manuscript:	Characteristics of Hydroxyapatite (HAp) from Cattle Bone Waste Using the Precipitation Method
Type of the Article	Original article

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PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	The importance of this manuscript for the scientific community: It investigated the reuse of waste bones to extract a benefit economical material that can develop the local industry in the country. In addition, the extracted Hydroxyapatite (HAp) may be useful as eco-friendly non-toxic biomaterial. The author must clarify the economical usefulness of the extracted Hydroxyapatite (HAp), the different industries that can be developed according to this material and the medical uses of it.	
Is the title of the article suitable? (If not please suggest an alternative title)	"Eco-friendly non-toxic biomaterial extracted from waste cow bones" is a better attention-grabbing title, in my opinion. If it is possible replace the present title by the suggested one:" Eco-friendly non-toxic biomaterial extracted from waste cow bones"	

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<p>Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.</p>	<p>There is a need to update the abstract. Aims: To investigate the synthesis of hydroxyapatite based on local cattle bones sourced from the area around Universitas Kristen Indonesia, Jakarta. Exploitation of bone waste to extract a vital material of high economic value. Study design: The type of research is Experimental experimental. Place and Duration of Study: Sample: Department of Physics Education, Kristen Indonesia University, Jakarta, between March 2024 and September 2024. Methodology: In this study, the cattle bones were boiled for 6 hours to remove fat, then washed with aquades, sun-dried, and dried thoroughly. After drying, the bones were calcined at 1000°C for 8 hours. The dried bones were then ground using a mortar until a fine powder was obtained. The resulting CaO powder was synthesized into hydroxyapatite through a wet precipitation method by adding phosphoric acid. The mixture of CaO powder and phosphoric acid was then sintered at 900°C for 5 hours. The phase of hydroxyapatite was determined through XRD and SEM testing. The calf bones used in this study were boiled for six hours to remove fat, after which they were cleaned with aquades, sun-dried, and completely dried. The bones were dried and then calcined for eight hours at 1000°C. After the bones were dried, they were pulverized into a fine powder in a mortar. Phosphoric acid was added to the resultant CaO powder to create hydroxyapatite using a wet precipitation technique. After that, the CaO powder and phosphoric acid mixture was sintered for five hours at 900°C. XRD and SEM measurements were used to determine the hydroxyapatite phase. Results: The results of the XRD analysis indicated that the hydroxyapatite phase (Hap) was successfully formed, exhibiting a hexagonal crystal system and space group P63/m. Additionally, this synthesis process also produced another compound, whitlockite (Ca57Mg6O168P42), which has a trigonal crystal system and space group R3c. SEM testing showed that the formed hydroxyapatite exhibited agglomeration, with individual particles generally being spherical in shape. The size of the produced hydroxyapatite particles was in the nanoscale, ranging from 500 to 900 nm. The hydroxyapatite phase (Hap), with a hexagonal crystal system and space group P63/m, was effectively produced, according to the XRD analysis results. A different chemical, whitlockite (Ca57Mg6O168P42), with a trigonal crystal structure and space group R3c, was also created during this synthesis technique. The generated hydroxyapatite displayed agglomeration, according to SEM analysis, with most of the individual particles having a spherical shape. The generated hydroxyapatite particles ranged in size from 500 to 900 nm, which is in the nanoscale. Conclusion: The synthesis of hydroxyapatite (HAp) biomaterial using cow bones as a base material for bone filler was successfully carried out using the wet precipitation method. The synthesis results indicate that the produced HAp possesses a crystalline phase with a hexagonal crystal system and space group P63/m. The size of the produced hydroxyapatite particles is in the nanoscale, ranging from 500 to 900 nm Conclusion: Utilizing cow bones as the starting material for bone filler, the hydroxyapatite (HAp) biomaterial was effectively synthesized utilizing the wet precipitation method. The synthesis results show that the generated HAp has a space group P63/m and a crystalline phase with a hexagonal crystal structure. The generated hydroxyapatite particles range in size from 500 to 900 nm, which is in the nanoscale.</p>	
<p>Are subsections and structure of the manuscript appropriate?</p>	<p>Yes</p>	
<p>Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.</p>	<p>This manuscript examined hydroxyapatite (HAp), a significant substance that can be utilized to restore damaged or missing bone. It might be very significant for medical applications and economical benefit.</p>	
<p>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</p>	<p>More recent references are required. 1- AREZOU MASHAK1, SAEED BAZRAEE and HAMID MOBEDI (2022) Advances in drug delivery and biomedical applications of hydroxyapatite-based systems: a review. Bull.</p>	

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	<p>Mater. Sci. (2022) 45:183 https://doi.org/10.1007/s12034-022-02758-6</p> <p>2- Stevo Najman, Vojislav Mitić, Thomas Groth, Mike Barbeck, Po-Yu Chen, Ziqi Sun and Branislav Randjelović (2023) Bioceramics, Biomimetic and Other Compatible Materials Features for Medical Applications. Engineering Materials, ISBN 978-3-031-17268-7 ISBN 978-3-031-17269-3. (eBook) Springer https://doi.org/10.1007/978-3-031-17269-4</p> <p>Sudip Mondal, Sumin Park, Jaeyeop Choi, Thi Thu Ha Vu, Vu Hoang Minh Doan, Truong Tien Vo, Byeongil Lee, Junghwan Oh (2023) Hydroxyapatite: A journey from biomaterials to advanced functional materials. Advances in Colloid and Interface Science 321 (2023) 103013 https://doi.org/10.1016/j.cis.2023.103013</p>	
<p>Minor REVISION comments</p> <p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>Yes, however I think the entire manuscript needs to have its wording revised generally.</p>	
<p>Optional/General comments</p>	<p>The introduction should cover the following topics: the medical applications of extracted hydroxyapatite (HAp) and the financial advantages of extracting it from waste bones. The results should contain a quantitative study of the nation's waste bone supply in relation to the amount of extracted hydroxyapatite (HAp).</p>	

PART 2:

	<p>Reviewer's comment</p>	<p>Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</p>
<p>Are there ethical issues in this manuscript?</p>	<p><i>(If yes, Kindly please write down the ethical issues here in details)</i></p>	

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