



CALL FOR PAPERS

Asian Symposium on Materials and Processing 2006 (ASMP2006)

Date:

November 9-10, 2006

Venue:

Sofitel Central Plaza Bangkok, Thailand

(http://www.centralhotelsresorts.com/scp_default.asp)

Purpose:

Enhancing mutual collaboration for higher research level and activity in the field of Materials and Processing Engineering in Asian region.

Organized by:

Japan Society of Mechanical Engineers, Division of
Materials and Processing, Japan

National Metal and Materials Technology Center, NSTDA,
Thailand

Sponsored by:

Japan Society of Mechanical Engineers,
Division of Materials and Processing



Scope:

The scope of the symposium will cover all the topics related Materials and Processing, such as:

- Engineering materials
- Functional materials / Smart materials
- Nano materials
- Composite materials
- Biomaterials
- Joining
- Powder metallurgy
- Casting
- Forming / Machining
- Mechanical properties / fracture / fatigue
- Nondestructive evaluation
- Automotive materials and technology
- Engineering Surface
- Others

Technical Tour: Nov.10 Toyota Motor Thailand Co.

Symposium Banquet: At 18:00 on Nov. 9

Registration fee: 2000Bhats (30000JPY from Japan)

Guide for authors: Submission Language: English

Presentation Language: English

Abstract submission:

A self-contained extended abstract of not more than 1 page, containing Introduction, Scope, Methodology, Results and Conclusions of the paper must be supplied before July 31, 2006.

Sample of extended abstract is attached. The abstract can be sent by e-mail through mutoh@mech.nagaokaut.ac.jp.

Manuscript submission:

The special issue of JSME International Journal, JMMP, will be published for the papers presented in the Symposium after peer review process.

The authors who wish to publish their papers should submit a full manuscript of not more than 8 pages on A4 paper together with a MS word or PDF file saved in a CD on-site on November 9, 2006. The format of manuscript will be informed later.

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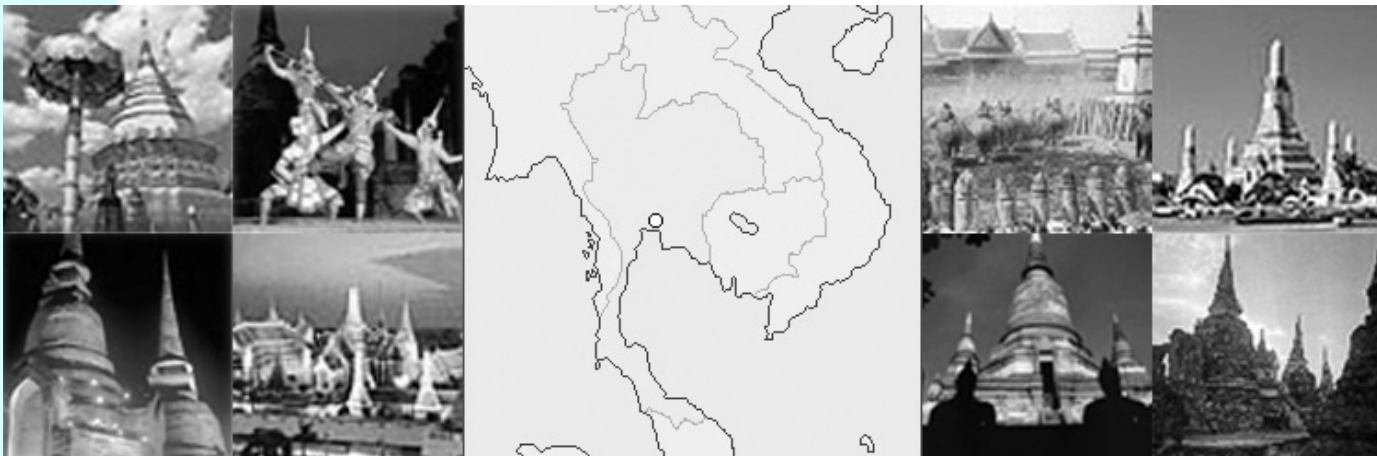
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I want to attend the symposium.

I want to present a paper.

Topic:

I want to submit a paper to JMMP.

Please send Registration form by 30th of June, 2006 to :

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COMPARISON OF DRY-MIXING AND WET-MIXING FIBRE REINFORCED HYDROXYAPATITE BIOCERAMICS

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KEY WORDS : bioceramics, composites, alumina fibre, fracture strength

ABSTRACT

In this work, an attempt was made to compare the effect of dry and wet mixing of Safil-Alumina Fibre Reinforced Hydroxyapatite (HA). After mixing (wet and dry) of fibre and HA, green compact were subsequently formed by uniaxial pressing and followed by sintering at 1200°C with three different soaking times i.e. 2, 4 and 6 hours for dry mixing and only 4 hours for wet mixing. The composites were characterized for physical and mechanical properties. Generally the increase in alumina fiber content results in lowering of bending strength, with the maximum strength 18.5 MPa by dry mixing. This is typically lower than expected and reasons for which will be explained.

INTRODUCTION

Hydroxyapatite has a large number of applications particularly bone implants and drug delivery systems. This is due to the excellent biocompatibility and bioactivity which is the result of it having identical-like mineral as human bone tissue [2]. However, mechanical reliability and crack growth resistance of the pure HAp ceramic is low, thus limiting to low loaded implants and coatings [3]. There have been efforts to improve its mechanical properties which includes reinforced HA composite. This is expected to improved wear resistance, toughness and strength [4]. With this, a study was made to investigate the effect of Safil alumina fiber as reinforcement material in HA.

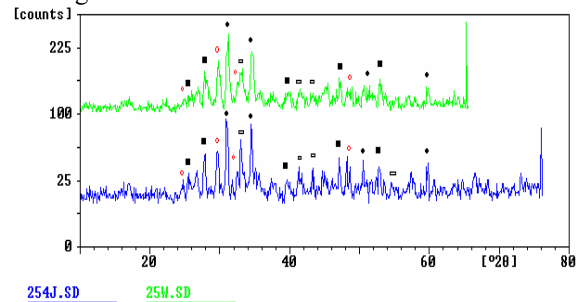
EXPERIMENTAL DETAILS

Raw materials used in this study were HAp powder $\text{Ca}_5(\text{PO}_4)_3(\text{OH})$, (FLUKA) and alumina fiber (Safil). 2 wt% binder (PEG 1500) was dissolved in deionised water and subsequently mixed with hydroxyapatite in a plastic bottle and mixed for 1 hour. Alumina fiber (5 wt%, 15wt% and 25wt%) was then added. The mixing process was for 7 hours. The mixture were then granulated and later formed into bar shape by pressing with pressure of 80 MPa. The bar were dried and sintered at 1200°C with three soaking

times of 2 hours, 4 hours and 6 hours. Samples were then analyzed for their properties, phase formed and microstructure. In wet mixing, a ratio of water to powder of 70:30 was used and the process subsequently similar to dry mix. Sintering was performed at 1200°C for only 4 hours soaking. The results were compared between dry mixing and wet mixing.

RESULTS & DISCUSSION

Figure 1 shows the XRD result for both dry and wet mixing.



The results shows that upon sintering, the HA still retains but interestingly was that there appear to have reactions between the alumina fibre and the matrix, forming Ca aluminate phase. The latter phase could be visibly observed under a scanning electron microscopy. This however had resulted in unexpected deterioration in mechanical properties. Dry mixing however had produced better properties.

CONCLUSION

Dry mixing produced better reinforced hydroxyapatite.

Reference

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- [4] Choi, J.W., Kong, Y.M. and Kim, H.E., (1998), *Jr Of The Amer Cer Soc*, 81(7), pp 1743-1748.