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Development of Waste Coir-reinforced Aluminum Matrix Automotive Brake Pad Material

Atiqah Afdzaluddin, **Md Abdul Maleque** and A. R. Zamani
Department of Manufacturing and Materials Engineering, Faculty of Engineering , International Islamic University Malaysia
Phone: 010-3682595, E-mail: maleque@iium.edu.my

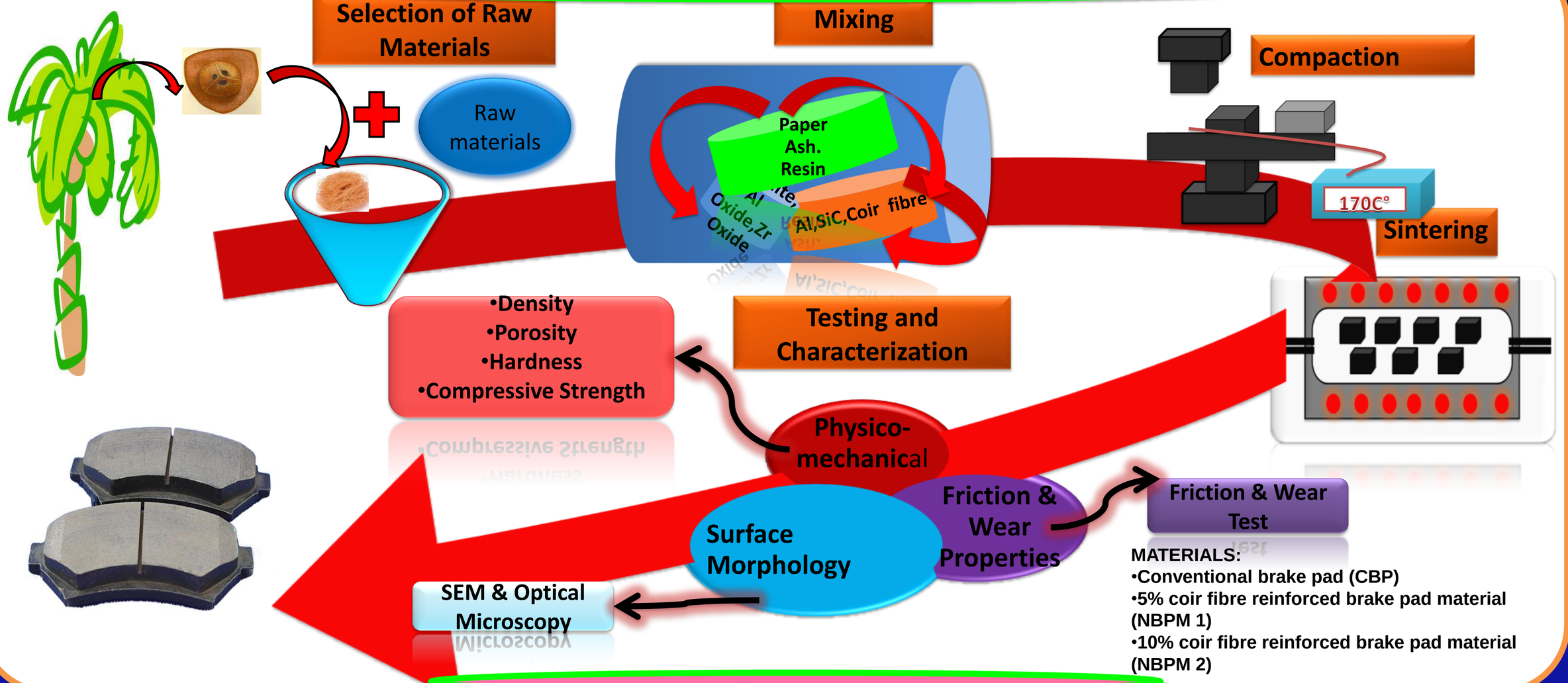
INTRODUCTION

•This work presents a new development of waste-reinforced aluminum matrix automotive brake pad materials with a view to replace the use of asbestos whose dust is carcinogenic and has a harmful effect to the human life.

NOVELTY

•Green asbestos-free brake pad using waste coir fibre
•Lighter weight material compared to conventional brake pad
•Cost effectiveness

MATERIALS & METHODOLOGY



MATERIALS:
•Conventional brake pad (CBP)
•5% coir fibre reinforced brake pad material (NBPM 1)
•10% coir fibre reinforced brake pad material (NBPM 2)

RESULTS AND DISCUSSION

1) PHYSICO-MECHANICAL

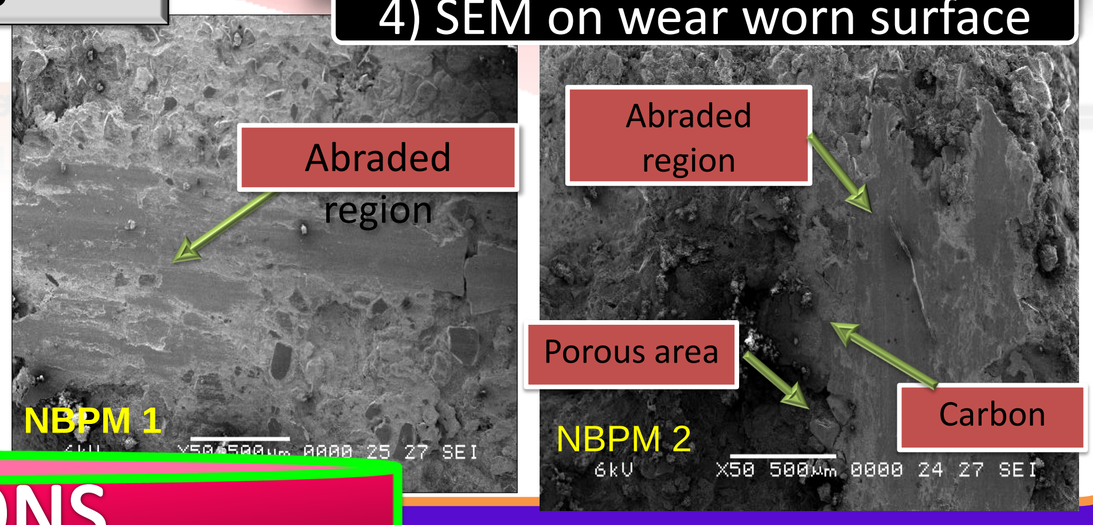
Materials	Density (g/cm³)	Porosity (%)	Hardness (HRS)	Compression Force (MPa)
NBPM 1	2.099	13.77	63.92	414.76
NBPM 2	1.974	15.32	52.18	393.12
CBP	3.3	14	76.2	110.00

2) FRICTION & WEAR

Sample	Normal Friction		Hot friction		Average Thickness Loss (%)	Observations/ Remark
	μ	Code	μ	Code		
NBPM 1	0.462	G	0.281	E	10.5	Passed
NBPM 2	0.434	F	0.374	F	12.3	Passed
CBP	0.468	F	0.373	E	14.6	Passed

3) OPTICAL MICROSCOPY

4) SEM on wear worn surface



CONCLUSIONS

•NBPM 1 with 5% vol. of coir fibre showed better physico-mechanical and tribological properties (both wear and friction)compared to NBPM 2 and CBP as well.
•Hence, natural coir fiber can be used as a candidate fiber or filler material for the mass-scale fabrication of asbestos-free brake pad without any harmful effect.

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