

Pengaruh temperatur sinter dan fraksi volume penguat  $\text{Al}_2\text{O}_3$  terhadap karakteristik komposit laminat hibrid  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$  produk metalurgi serbuk = The effect of sintering temperature and  $\text{Al}_2\text{O}_3$  reinforcement volume fraction on the characteristic of  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$  hybrid laminate composite as a powder metallurgy product

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## Abstrak

Kebutuhan material yang semakin tinggi mendorong manusia untuk menciptakan sebuah rekayasa material, maka dikembangkanlah komposit laminat hibrid dengan Al sebagai matriks dan SiC serta  $\text{Al}_2\text{O}_3$  sebagai penguatnya. Pembuatan komposit laminat hibrid  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$  ini menggunakan proses metalurgi serbuk dengan proses pelapisan *electroless plating* logam Mg untuk meningkatkan keterbasahan. Pada penelitian ini dilakukan variasi temperatur sinter  $600^\circ\text{C}$ ,  $650^\circ\text{C}$  dan  $700^\circ\text{C}$  serta variasi fraksi volume penguat  $\text{Al}_2\text{O}_3$  10%, 20%, 30%, dan 40% untuk mengetahui karakteristik material komposit laminat hibrid  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$ .

Hasil menunjukkan bahwa peningkatan temperatur sinter dan fraksi volume penguat  $\text{Al}_2\text{O}_3$  akan meningkatkan densitas dan modulus elastisitas serta menurunkan porositas pada komposit laminat hibrid  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$ .

<hr><i>The increasing demand of material has motivated human being to create a material design. This stimulates the developing of hybrid laminate composite by the use of Al as the matrix and SiC and  $\text{Al}_2\text{O}_3$  as the reinforcements. The  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$  hybrid laminate composite is done by using powder metallurgy process by means of Mg metal electroless plating process in order to increase wettability.

In this research, the variations of  $600^\circ\text{C}$ ,  $650^\circ\text{C}$  and  $700^\circ\text{C}$  sintering temperature and the variations of 10%, 20%, 30% and 40%  $\text{Al}_2\text{O}_3$  reinforcement volume fraction were done to find out the characteristic of  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$  hybrid laminate composite material.

The result showed that the raising of the sintering temperature and the  $\text{Al}_2\text{O}_3$  reinforcement volume fraction increases the density and the modulus elasticity and decreases the porosity of the  $\text{Al}/\text{SiC}-\text{Al}/\text{Al}_2\text{O}_3$  hybrid laminate composite.</i>