

Pengaruh penambahan fraksi volum penguat terhadap sifat mekanis pada komposit Al-Mg-Si berpenguat nanopartikel Al₂O₃ melalui proses stir casting = Influence of volume fraction reinforce addition on mechanical properties of Al-Mg-Si composite reinforced Al₂O₃ nanoparticle by stir casting process

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Abstrak

[Komposit bermatriks aluminium dengan penguat partikel Al₂O₃ berukuran nano umum digunakan untuk aplikasi dengan performa yang tinggi karena aluminium memiliki sifat ringan dan Al₂O₃ memiliki performa yang baik pada suhu tinggi. Pada penelitian ini, penambahan Al₂O₃ dengan fraksi volum 0,2%, 0,5%, 0,7%, 1,0%, and 1,2% dilakukan untuk menentukan titik optimum dari kelima komposisi. Magnesium sebanyak 10 wt.% ditambahkan sebagai wetting agent. Hasil penelitian menunjukkan kekuatan optimum dicapai dengan penambahan fraksi volum nano-Al₂O₃ sebanyak 0,2% dengan 200,84 MPa dan keuletan yang baik, didukung dengan rendahnya porositas, rendahnya aglomerasi, dan pembentukan dimple pada permukaan patah.

.....Aluminium Matrix Composites (AMCs) reinforced with nano-sized Al₂O₃ particles are widely used for high performance application because aluminium has light weight and alumina has good performance at high temperature. In this study, the percentage of nano-sized Al₂O₃ with volume fraction 0.2%, 0.5%, 0.7%, 1.0%, and 1.2% are performed to determine the optimum point of the fifth variation. Magnesium with 10 wt.% are added as a wetting agent. The result showed the optimum strength was reached by 0.2 %Vf nano-Al₂O₃ reinforced composite with 200.84 MPa and enough ductility, supported by evidence low porosity, low agglomeration, and dimples formation on SEM image.

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