

Pengaruh penambahan stronsium sr terhadap karakteristik komposit adc12/nano-al₂o₃ dengan penambahan penghalus butir al-ti-b melalui pengecoran aduk = Study of strontium effect on adc12 nano al₂o₃ composite characteristics with al ti b grain refiner addition by stir casting method

Muhammad Al Wafiy, author

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Abstrak

Penelitian ini dimaksudkan untuk mengetahui pengaruh variasi penambahan pemodifikasi butir Sr terhadap mikrostruktur dan sifat mekanis material komposit ADC12 dengan penguat berupa partikel nano-Al₂O₃ sebanyak 0,3 vf . Fabrikasi komposit dilakukan dengan metode pengecoran aduk. Dilakukan penambahan Mg sebagai agen pembasah sebanyak 5 wt , Al-5Ti-B sebagai penghalus butir sebanyak 0,04 wt , dan Sr sebagai pemodifikasi butir dengan variasi penambahan sebanyak 0,018; 0,021; 0,026; 0,028; dan 0,037 wt . Untuk mengkarakterisasi produk fabrikasi, dilakukan pengujian komposisi kimia, pengamatan metalografi, pengujian SEM-EDS, pengujian XRD, pengujian kekerasan, pengujian aus, pengujian tarik, dan pengujian impak.

Hasil pengujian material secara umum menunjukkan peningkatan karakteristik mekanis material, disebabkan karena peran Sr dalam modifikasi morfologi kristal silikon dan quasi-binary Mg₂Si, reduksi ukuran SDAS, serta agen pembasah dalam sistem komposit. Namun, penambahan Sr berlebih akan meningkatkan porositas material.

.....This research is intended to know the effect of variation of addition of Sr as a modifier on microstructure and mechanical properties of ADC12 composite material with reinforcement of 0,03 vf nano Al₂O₃ particles. Composite fabrication is done by stir casting method. The addition of Mg as wetting agent was 5 wt , Al 5Ti B as a grain refiner was 0.04 wt , and Sr as modified grain with varying addition as much as 0.018 0.021 0.026 0.028 and 0.037 wt . To characterize the composite product, several testing is done, which is chemical composition characterization, metallographic observation, SEM EDS characterization, XRD characterization, hardness testing, wear testing, tensile testing, and impact testing.

The results of mentioned testing generally indicate an increase in mechanical properties of the material, due to the role of Sr in the morphological modification of silicon and quasi binary Mg₂Si, SDAS size reduction, and wetting agents in the composite system. However, excess addition of Sr will increase the porosity of the material.