Comparison between the properties of Al-TiC and Al (TiC+Fe3C+Fe2Ti+Fe) composites.

Abstract

This paper aims to study the efficacy of (TiC+Fe_3C+Fe_2Ti+Fe) powder mixture produced by a new synthesis technique utilizing a cheap source of Fe–Ti and C (in terms of wear resistance and hardness). The powder product was used as reinforcement in Al matrix. Composites were produced by mixing 20 wt% of the reinforcing powder and 80 wt% of Al followed by 10 ton cold pressing and sintering for 2 h at 500 °C. The composites reinforced with the synthesized powders were compared with the composites produced using pure TiC as reinforcement material. Wear rate and hardness of composites using synthesized TiC mixture as the reinforcement material were found to be very close to that produced with pure TiC. The results of wear and hardness thus confirm that the synthesized powders containing TiC, Fe_3C, Fe_2Ti, and Fe can replace pure TiC in aluminum matrix composite applications.

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