عنوان مقاله:

On the Study of Mechanical Properties of Aluminum/Nano-Alumina Composites Produced via Powder Injection Molding

محل انتشار:

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خلاصه مقاله:

Powder Injection Molding (PIM) is a precision manufacturing process used for production of advanced composites. Mixing of polymeric binder with metal powders, molding of feedstock, de-binding of brown parts and sintering of green samples are four main steps of this process. In the present study, the compounds containing multi-component binder system and aluminum/ nano-alumina (0-9 wt.%) powders were prepared and used as feedstock. After that, the feed-stocks were injected, de-bound and sintered for producing standard specimens. Finally, the sintered composites were produced with a maximum relative density of 97.7%. Afterward, the hardness, yield and ultimate tensile strength of the nano-composites were evaluated. The results showed that the relative density, hardness and strength of the manufactured composites increased due to the addition of nano-reinforcements. It is demonstrated that the effect of alumina on the density of PIM composites differs from that of conventional powder metallurgy. Scanning Electron .Microscope (SEM) reveals that the agglomeration takes place in the sample containing 9 wt.% nano-alumina

کلمات کلیدی:

Aluminum matrix composite, Nano-reinforcement, Powder injection molding, Mechanical properties