Sintering and Age Hardening Behavior of P/M processed Al-6wt%Cu-10vol%Al_2O_{3p} Composites

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Abstract

Sintering and age hardening behavior of P/M processed Al-6wt%Cu-10vol%Al_2O_{3p} composites were investigated using blended elemental mixtures which were compacted to 90 % theoretical density (T.D.) and sintered for 1 hr at 625℃ under N_2. Sintered density and TRS were about 93% T.D. and 260 MPa, respectively before repressing at ambient temperature to about 98% T.D. The repressed samples were solution treated at 530 and 565℃, artificially aged for 22 hr at 150℃ and then their Rockwell B (RWB) hardness and TRS curves measured and examined. Although RWB hardness of 73 was obtained for all composites, the TRS and displacement showed noticeable dependence on solution treatment temperature: 550 MPa and 0.5 mm for 565℃ solution-treated composites were higher than 400 MPa and 0.4 mm of 530℃ solution-treated composites. However, more dimensional change was observed for 565℃-treated samples and this is attributed to more abundant Al-Cu liquid phase formed.

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