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On the preparation and characterization of novel Al/CMA nanocomposite via powder technology

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Abstract: Complex metallic alloys (CMAs) are new possible candidates for reinforcing agents with excellent technological potential. The β -Al₃Mg₂ belongs to this new category of intermetallics. β -Al₃Mg₂ nano particles were synthesized by mechanical milling (MM) of Pre-alloyed CMA intermetallic ingot in attritor ball mill. Then different amount of CMAs nanoparticles varied from 0 to 20% (by weight) were added to Aluminum matrix powder. Consolidated samples were prepared by hot pressing of blended composite powder. Phase and Microstructural characterization were performed applying X-ray diffractometer (XRD), optical microscope (OM) and scanning electron microscope (SEM) equipped with energy dispersive X-ray (EDX). The results confirmed the formation of uniform distributed reinforcement in nanocomposites with finer microstructure by addition of CMA reinforcement.

Keywords: Nanocomposite, Al/ CMA, Powder Technology, Mechanical Alloying.