

## عنوان مقاله:

Fabrication of hybrid composites of Aluminum/Alumina/Silicon carbide by accumulative roll bonding and evaluation of their microstructure and mechanical properties

## محل انتشار:

دومین کنفرانس بین المللی آلومینیوم (سال: 1391)

تعداد صفحات اصل مقاله: 7

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## خلاصه مقاله:

A new kind of metal matrix composite with a matrix of pure aluminum (99.9%) and hybrid reinforcement of Al<sub>2</sub>O<sub>3</sub> and SiC particulates was fabricated by accumulative roll bonding (ARB) process. This is the first study that manufactures high-strength and high-uniform hybrid composite by ARB process due to its ability in the industry. Anodizing process was used to grow alumina layer on the substrate of aluminum strips. The mechanical properties and microstructure of the ARB-processed composites have been investigated within different stage of ARB process by mechanical testing and optical microscopy. With the cycles of ARB, the alumina layers necked and fractured and so a homogenous distribution of Al<sub>2</sub>O<sub>3</sub> particles in the aluminum matrix achieved. Also hybrid composite showed an improving in distribution of SiC particles and a decreasing in porosity between particles and matrix by increasing the cycles' number. It was observed that the tensile strength of composites improved by increasing the ARB passes so that the tensile strength of the Al/0.5 vol.% Al<sub>2</sub>O<sub>3</sub>/ 4 vol.% SiC composite became 2.4 times higher than as-received material, while the changes in elongation value were various. Also tensile strength improved by increasing volume fraction of SiC particles.

## کلمات کلیدی:

Hybrid metal matrix composite (HMMC), Accumulative roll bonding (ARB), Microstructure, Mechanical properties

## لینک ثابت مقاله در پایگاه سیویلیکا:

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