

Manufacturing and Characterization of Ni-Matrix Composite Reinforced with Ti₃SiC₂ and Ti₂AlC; and Al-Matrix with Ti₂SiC

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Abstract : In this paper, we report for the first time on the synthesis and characterization of novel MAX phases (Ti₃SiC₂, Ti₂AlC) reinforced Ni-matrix and Ti₂AlC reinforced Al-matrix. The stability of MAX phases in Al-matrix and Ni-matrix at a temperature of 985°C has been investigated. All the composites were cold pressed and sintered at a temperature of 985°C for 20min in H₂ environment, except (Ni/Ti₃SiC₂) who was sintered at 1100°C for 1h. Microstructure analysis by scanning electron microscopy and phase analysis by X-Ray diffraction confirmed that there was minimal interfacial reaction between MAX particles and Ni, thus Al/MAX samples shown that MAX phases was totally decomposed at 985°C. The Addition of MAX enhanced the Al-matrix and Ni-matrix.

Keywords : MAX phase, microstructures, composites, hardness, SEM

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