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A. Contreras Cuevas, E. Bedolla Becerril, M.S. Martínez, J. Lemus Ruiz

Metal Matrix Composites

Wetting and Infiltration

- **Addresses the fabrication process and characterization of composites with several matrix and reinforcement materials.**
- **Discusses structural, chemical, and mechanical characterization of composites fabricated with aluminum and magnesium alloys as matrices reinforced with titanium carbide (TiC), aluminum nitride (AlN), silicon carbide (SiC) and alumina (Al2O3).**
- **Focuses on the pressureless infiltration technique while considering wetting, joining, wear and corrosion issues.**

This book covers several aspects of the synthesis of composites by the pressureless infiltration technique. It describes the methods used to obtain green preforms, such as cold pressed and hot sintering, describing the heating time, load, and time required for pressing the preforms. Additionally, wettability phenomena, which is directly related on infiltration, is extensively described. Wettability process and interfacial reactions are analyzed in many ceramic-metal systems prior to fabricate the composites. A complete description of fabrication processes for Metal Matrix Composites is included. An extensive section on structural, chemical, and mechanical characterization of composites fabricated with aluminum and magnesium alloys as matrices reinforced with titanium carbide (TiC), aluminum nitride (AlN), silicon carbide (SiC) and alumina (Al2O3) is included. Relevant techniques for joining composites, such as welding and brazing are addressed. As well as issues pertaining to the corrosion and wear of composites are discussed as well.Corrosion behavior of some composites exposed to aqueous media was analyzed. Corrosion of composites using TiC and SiC like reinforcement and Al, Ni, and some Al-Cux, Al-Mgx and Al-Cu-Li alloys like matrix is discussed extensively. The structural characterization techniques addressed include: scanning electron microscopy (SEM), X-ray diffraction (XRD), transmission electron microscopy (TEM), optical microscopy (OM), differential thermal analysis (DTA), high resolution transmission electron microscopy (HRTEM), and thermogravimetry analysis (TGA).