

PRODUCTION AND CHARACTERIZATION OF STAINLESS STEEL MATRIX COMPOSITES BY POWDER METALLURGY

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ABSTRACT

Stainless steel parts were produced by Powder Metallurgy (PM) process is important in PM parts. These parts have good corrosion resistance and mechanical properties. Properties of these parts can be change with different secondary operations and additions powder. In this study, austenitic grade 316L and ferritic grade 430L stainless steel powder was used. Different particle sized Al₂O₃, Y₂O₃ and ZrO₂ powder was used as reinforcement. Stainless steel powders contain 0-10 wt% reinforced powders. All powders were mixed and then they were molded in single forced mold at 600 MPa, as standards tensile tests shapes. Preformed samples were sintered at 1250°C and 1400°C for 1 hour under vacuum atmosphere. Density of the sintered samples was measured via Archimedes principles. Hardness and tensile testing were performed each specimens as standards and their mechanical properties were determined. Microstructural evolution of samples was determined by optic microcopy (OM) and scanning electron microscopy (SEM). All extracted data from experiments were compared and discussed with literatures.

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