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Mechanical properties and fracture study of high-alloyed iron powder mixtures sintered and submitted to heat treatment.

Neves, M. D. M.(1) ; Ambrozio, F. F.(2);
(1) IPEN-CCTM-LabMP (2) FEI-Dpto Materiais

Many alloying techniques have been designed with the purpose of enhancing the microstructural and mechanical properties of sintered steels. Among those, the mixing of high compressible iron powders with certain amounts of high-alloyed iron powders plus carbon and nickel has been utilized. The Fe-Mo and Fe-P (Fe₃P) compounds were mixed with iron powder in different concentrations. The sintered samples were submitted to heat treatment and characterized by Vickers microhardness and three point bending test. The results showed that greater addition of Fe-Mo and Fe-P reduced the three point bending. The objectives of present article are the mechanical behavior analysis and study of the fractured surface of the composite powder mixture of a plain iron powder with various additions of high-alloyed steel, carbon, nickel and lubricant powders.