

storage alloys. This paper reports the results of investigations of the microstructure and chemical composition of some commercial La-based alloys represented by the formulae, La₂Mgx, La₂Mgx-1Ni and LaMg₂Ni₉ (x=12 or 17). The determination of the microstructure and phase composition of these alloys has been carried out using scanning electron microscopy, energy dispersive X-ray analysis and X-ray diffraction analysis. The characterization of the well-known LaNi₅ alloy has also been included in the present work for a comparison.

01/20

X-Ray Diffraction Analysis And Magnetic Properties Of Pr-Fe-B HDDR Powder And Magnets.

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Fine magnetic powder has been produced using the hydrogenation disproportionation desorption and recombination (HDDR) process. The first stage in this work involved an investigation of a range of disproportionation/desorption temperatures between 800 and 900°C with the purpose of optimizing the HDDR treatment for a Pr₁₄Fe₈₀B₆ alloy. The cast alloy was annealed at 1100°C for 20 hours for homogenization. The optimum disproportionation temperature for achieving high anisotropy was 820°C. The influence of the reaction temperature on the microstructure and magnetic properties of Pr₁₄Fe₈₀B₆ HDDR powders and magnets has been shown. The second stage of the work involved the characterization, for each temperature, of the HDDR processed powder using X-ray diffraction analysis. The phases and crystallite sizes in the HDDR material have been determined by this technique. Scanning electron microscopy (SEM) has also been employed to reveal the morphology of the HDDR powder.

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01/21

Quantitative Analysis of Phases Formed in the Aluminothermic Reduction of Ta₂O₅ by Plasma

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In this work, we have developed a novel technique of aluminothermic reduction that uses hydrogen plasma to trigger the reaction in a plasma reactor, seeking to obtain tantalum in form of powder. The reacted powders were analyzed by XRD and SEM. Rietveld method was used to quantify the phases fractions present in the product of reaction. The results showed that one phase rich in tantalum was obtained, and it presented a dendritic structure, typical of molten metals. This phase occurred in significant amounts onto the surface and in interior of the reacted gains.

02/01

Erosive wear reduction in heat pipe exchangers used in thermoelectrical plants

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The machinery used in coal thermoelectrical plants usually is submitted to erosive wear. The erosive wear occurs mainly in the metallic pipe set of heat exchangers due the flow of hot gases carrying erosive particles. Jorge Lacerda's thermoelectrical complex at Capivari de Baixo city holds seven power units, where two units use approximately 20 000 ASTM A178 heat pipes. The set is submitted to a semester maintenance schedule (preventive and corrective) where the damaged pipes are changed. So, in this work a set of erosive wear accelerated tests according