IPEN/CNEN-SP
BIBLIOTECA
"TEREZINE ARANTES FERRAZ"

Formulário de envio de trabalhos produzidos pelos pesquisadores do IPEN para inclusão na Produção Técnico Científica

AUTOR(ES) DO TRABALHO:
A M Saliba I.Costa (IPEN/CENEN-SP)

LOTAÇÃO: CCTM RAMAL:9344

TIPO DE REGISTRO:

art. / periód.:		Publ. IPEN		. resumo	X
cap. de livro		Art. conf		outros (folheto, relatório, etc...)	

TITULO DO TRABALHO:
Corrosion Inhibition of a Commercial NdFeB Magnet by Phosphating

APRESENTADO EM: (informar os dados completos - no caso de artigos de conf., informar o título da conferência, local, data, organizador, etc..)
PTECH'99 2nd INTERNACIONAL LATIN-AMERICAN CONFERENCE ON POWDER TECHNOLOGY, 10 a 12 de novembro de 1999 Foz do Iguaçu.

PALAVRAS CHAVES PARA IDENTIFICAR O TRABALHO:
NdFeB magnets, Corrosion, Phosphating

ASSINATURA: Isolde Costa

DATA: 22/04/2002

PRODUÇÃO TECNICO CIENTÍFICA
DO IPEN
DEVOLVER NO BALCÃO DE
EMPRÉSTIMO

M097

Anadvanced Generation System for Sintering Atmospheres

Caio Mogyca; Fernand Heine; Pascale Pourtalet-McSweeny; Patrick Cappin; Melvin Renawden (Air Liquide Brasil S.A.)

A new state-of-the art on-site service was especially developed for the P/M industry to produce a special gas composition to sinter all kinds of parts. Called ALNAT I, the design of the system allows the end-user to consistently produce high quality parts. It incorporates all the features needed to run the system smoothly and safely. The computer- controlled on-site unit has the capability of measuring and recording all the key data, which are necessary in order to perform SPC/ SQC and to comply with ISO 9000. The tests showed that the ALNAT I system performs similar to a mixture of 90%N2+ 10% H2. In addition, carbon control with the on-site atmosphere system is enhanced compared to endothermic gas and equal to the nitrogen hydrogen mixture.

M098

Centrifugal Atomisation of Alloys

Huiping Li (1,2); P. Tsakiropoulos (1); T. Johnson (3)
(1) University of Surrey; (2) East China University of Science and Technology; (3) Tetronics Ltd

The Centrifugal Atomisation (CA) process is used for the production of powders of a variety of alloys, which include Al and Ti based alloys, superalloys and steels. The most widely used variant of CA is the rotating electrode process (REP). A basic requirement of REP is that the alloy to be atomised is available in bar form. This restriction means that REP is often not suitable for the production of powders of developmental alloys. The CA variant, which is based on the rotating disk principle, is suitable for the production of powders of reactive and refractory metal alloys, including developmental alloys and can be used with clean melting technology. Near net shape processing via spray casting on a cylindrical substrate is also possible. The paper will discuss the basic phenomena of melt - disk interaction and the break up and atomisation of the melt at the edge of the disk. Model predictions will be compared with experimental results.

M099

Corrosion Inhibition of a Commercial NdFeB Magnet by Phosphating

A.M. Saliba-Silva; I. Costa (IPEN/CNEN-SP)

Key words: Corrosion, NdFeB Magnets, Phosphating - NdFeB magnets are susceptible to corrosion in normal working enviranments. Hence, they are usually protected against corrosion with coatings, such as epoxies, electrodeposited nickel, among others. However, eventual failure of the coating exposes the magnet surface to corrosion. Protection of magnets prior to application of coatings is therefore a way of providing protection to the substrate material on the defective regions of the coating. Phosphating is a well known process to protect carbon steels and other ferrous alloys in general, being often used as a pretreatment before the application of coatings. This study reports the experimentol work carried out to obtain a corrasion inhibiting layer directly on NdFeB magnet surfaces, structurally coherent with the matrix. The characteristic of the layer formed on the free magnet surface, by immersion in a solution of 0.15M NaH2PO4 acidified with H2SO4, has been investigated. The corrosion resistance of the layer formed was tested in a solution of 1%(wt) NaCl plus 5mM H2SO4 with pH of 2.9, by means of electrochemical impedance spectroscopy (EIS) and cyclic polarization tests. The results indicated that NdFeB magnets can be protected by the phosphate layer formed in fairly aggressive media. The corrosion resistance of the phosphate layer formed was demonstrated by anodic polarization, as the breakdown of this layer and corrasion of the magnet, only occurred at an overpotential of approximately 400 mV.

PRODUÇÃO TECNICO CIENTÍFICA DO IPEN
DEVOLVER NO BALCÃO DE EMPRÉSTIMO

M097

Anadvanced Generation System for Sintering Atmospheres

Caio Mogyca; Fernand Heine; Pascale Pourtalet-McSweeny; Patrick Coppin; Melvin Renowden (Air Liquide Brasil S.A.)

A new state-of-the art on-site service was especially developed far the P/M industry ta produce a special gas compositian to sinter all kinds of parts. Called ALNAT I, the design of the system allows the end-user to consistently produce high quality parts. It incarporates all the features needed to run the system smoathly and safely. The computer- controlled on-site unit has the capability af measuring and recording all the key data, which are necessary in order ta perfarm SPC/ SQC and to comply with ISO 9000. The tests shawed that the ALNAT I system performs similar ta a mixture of 90%N2+ 10% H2. In addition, carbon contral with the on-site atmosphere system is enhanced compared to endothermic gas and equal to the nitrogen hydrogen mixture.

M098

Centrifugal Atomisation of Alloys

Huiping Li (1,2); P. Tsokiropoulos (1); T. Johnson (3)
(1) University of Surrey; (2) East China University of Science and Technology; (3) Tetronics Ltd

The Centrifugal Atomisation (CA) process is used for the production af powders of a variety of alloys, which include Al and Ti based alloys, superalloys and steels. The most widely used variant of CA is the rotating electrode process (REP). A basic requirement of REP is that the allay to be atamised is available in bar farm. This restriction means that REP is often not suitable for the production of powders of developmental alloys. The CA variant, which is based on the rotating disk principle, is suitable for the production of powders of reactive and refractary metal alloys, including developmental alloys and can be used with clean melting technology. Near net shape processing via spray casting on a cylindrical substrate is alsa passible. The paper will discuss the basic phenomena af melt - disk interaction and the break up and atomisation of the melt at the edge of the disk. Model predictions will be compared with experimental results.

M099

Corrosion Inhibition of a Commercial NdFeB Magnet by Phosphating

A.M. Salibo-Silva; I. Costa (IPEN/CNEN-SP)

Key wards: Corrosian, NdFeB Mognets, Phasphoting - NdFeB magnets are susceptible ta corrosion in narmal working environments. Hence, they are usually pratected against corrasian with coatings, such as epoxies, electradeposited nickel, among others. Hawever, eventual failure of the coating expases the magnet surface ta carrasion. Protectian of magnets prior to application of caatings is therefore a way of providing protection to the substrate material on the defective regions of the coating. Phosphating is a well knawn process to protect carbon steels and other ferrous alloys in general, being often used as a pretreatment before the applicotion af coatings. This study reports the experimental work carried aut to obtain a corrosion inhibiting layer directly on NdFeB magnet surfaces, structurally coherent with the matrix. The characteristic af the layer farmed on the free magnet surface, by immersion in a solutian of 0.15M NaH2PO4 acidified with H2SO4, has been investigated. The corrasian resistance of the layer formed wos tested in a salutian of 1%(wt) NaCl plus 5mM H2SO4 with pH of 2.9, by means of electrochemical impedance spectrascapy (EIS) and cyclic polarization tests. The results indicated that NdFeB magnets can be protected by the phosphate layer formed in fairly aggressive media. The corrosion resistance af the phasphate layer formed was demonstrated by anadic polarization, as the breakdown af this layer and corrosion of the mognet, only occurred at an overpotential of approximately 400 mV.