Promoted V$_2$O$_5$/TiO$_2$ catalysts for selective catalytic reduction of NO with NH$_3$ at low temperatures

The influence of varying the V$_2$O$_5$ content (3–6 wt.%) was studied for the selective catalytic reduction (SCR) of nitrogen oxides by ammonia on heteropoly acid (HPA)- and tungsten oxide (WO$_3$)-promoted V$_2$O$_5$/TiO$_2$ catalysts. The SCR activity and alkali deactivation resistance of HPA-promoted V2O5/TiO2 catalysts was found to be much higher than for WO$_3$-promoted catalysts. By increasing the vanadium content from 3 to 5 wt.% the catalysts displayed a two fold increase in activity at 225 °C and retained their initial activity after alkali doping at a molar K/V ratio of 0.181. Furthermore, the catalysts were characterized by N$_2$ physisorption, XRPD, NH$_3$-TPD, H$_2$-TPR, Raman, FTIR and EPR spectroscopy to investigate the properties of the catalysts. XRPD, Raman and FTIR showed that promotion with 15 wt.% HPA does not cause V$_2$O$_5$ to be present in crystalline form, also at a loading of 5 wt.% V$_2$O$_5$. Hence, use of HPAs does not cause increased N$_2$O formation or unselective oxidation of NH$_3$. NH$_3$-TPD showed that promotion by HPA instead of WO$_3$ causes the catalysts to possess a higher number of acid sites, both in fresh and alkali poisoned form, which might explain their higher potassium tolerance. Ex-situ EPR spectroscopy revealed that HPA-promoted catalysts have higher V$^{IV}$/V$^{III}$ ratios than their WO$_3$-promoted counterparts. H$_2$-TPR suggests that HPAs do not have a beneficial effect on the V$^{IV}$/V$^{III}$ redox system, relative to WO$_3$.

General information
State: Published
Organisations: Department of Chemistry, Department of Chemical and Biochemical Engineering, Centre for Catalysis and Sustainable Chemistry, DTU Admission Course, CHEC Research Centre, Department of Chemistry
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Main Research Area: Technical/natural sciences

Publication information
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Volume: 183
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BFI (2018): BFI-level 2
BFI (2017): BFI-level 2
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 8.86 SJR 2.583 SNIP 2.12
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 2.26 SNIP 2.081 CiteScore 7.72
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 2.232 SNIP 2.164 CiteScore 6.92
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): SJR 2.345 SNIP 2.134 CiteScore 6.42
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): SJR 2.629 SNIP 2.236 CiteScore 6.08
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): SJR 2.585 SNIP 2.345 CiteScore 6.14
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 2.461 SNIP 1.895
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 2.301 SNIP 2.232
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 2.455 SNIP 2.275
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 2.493 SNIP 2.5
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 2.284 SNIP 2.229
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 2.095 SNIP 2.233
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 2.393 SNIP 2.41
Scopus rating (2003): SJR 1.979 SNIP 2.259
Scopus rating (2002): SJR 2.304 SNIP 1.847
Scopus rating (2001): SJR 2.781 SNIP 2.441
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 2.687 SNIP 2.13
Scopus rating (1999): SJR 2.18 SNIP 1.874
Original language: English
SCR of NO with NH3, V2O5, Potassium poisoning, Heteropoly acids
Electronic versions:
1_s2.0_S0926337315302253_main.pdf
DOIs:
10.1016/j.apcatb.2015.10.044
Source: FindIt
Source-ID: 2287663906
Publication: Research - peer-review › Journal article – Annual report year: 2015
Combined oxidation and absorption of nox by an ionic liquid tandem process.
The present invention relates to a new strategy for capturing NOx using a two-step process.

General information
State: Published
Organisations: Department of Chemistry, Department of Chemistry, Centre for Catalysis and Sustainable Chemistry, Organic Chemistry, DTU Admission Course, Center for Hyperpolarization in Magnetic Resonance, Office for Research and Relations, Risø National Laboratory for Sustainable Energy
Publication date: 22 Oct 2015

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WO2015158849A1.pdf
Main Research Area: Technical/natural sciences
Source: espacenet
Source-ID: WO2015158849
Publication: Research › Patent – Annual report year: 2016

Characterization of spectral compression of OFDM symbols using optical time lenses
We present a detailed investigation of a double-time-lens subsystem for spectral compression of OFDM symbols. We derive optimized parameter settings by simulations and experimental characterization. The required chirp for OFDM spectral compression is very large.

General information
State: Published
Organisations: Department of Photonics Engineering, High-Speed Optical Communication, DTU Admission Course, National Space Institute, Department of Micro- and Nanotechnology
Authors: Røge, K. M. (Intern), Guan, P. (Intern), Kjøller, N. (Intern), Lillieholm, M. (Intern), Galili, M. (Intern), Morioka, T. (Intern), Oxenløwe, L. K. (Intern)
Pages: 303-304
Publication date: 2015

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Title of host publication: Proceedings of 2015 IEEE Photonics Conference
Publisher: IEEE
ISBN (Print): 9781479974658
Main Research Area: Technical/natural sciences
Conference: 2015 IEEE Photonics Conference, Reston, Virginia, United States, 04/10/2015 - 04/10/2015
Photonics and Electrooptics, Chirp, Lenses, Numerical simulation, ofdm, optical signal processing, Switches, time lens, Wavelength division multiplexing
DOIs:
10.1109/IPCon.2015.7323656
Source: FindIt
Source-ID: 276556050
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Synchrotron Based Structural Investigations of Mass-Selected PtGd Nanoparticles and a Gd/Pt(111) Single Crystal for Electrochemical Oxygen Reduction
The sluggish kinetics of the oxygen reduction reaction (ORR) hinders the commercialization of proton exchange membrane fuel cells (PEMFC). The ORR activity is enhanced by alloying Pt with late transition 3d metals (i.e. Fe, Co, Ni, and Cu)1. However, these compounds tend to degrade in a fuel cell by dealloying. An alternative approach is to alloy Pt with rare-earth elements. Their highly negative alloying energy may provide them with kinetic stability against dealloying under reaction conditions. A recent publication from our group reported the high ORR activity and stability of polycrystalline Pt5Gd2. In this work, we present the experimental results of mass-selected PtGd nanoparticles synthesized by gas aggregation after sputtering of an alloy target in an ultrahigh vacuum (UHV)3. PtGd nanoparticles with nominal sizes of 3, 5, 7, and 9 nm were selected using time-of-flight mass filtering and deposited on glassy carbon
Rotating ring disk electrode (RRDE) measurements in 0.1 M HClO4 were used to measure the activity in comparison to pure Pt 4. The ORR specific activity increases with the nanoparticle size; a maximum mass activity is achieved with the 7 nm sample, ~3.6 A/mg Pt at 0.9 V. X-ray absorption spectroscopy measurements suggest that the high ORR activity is due to a compressive strain exerted by the alloy core onto the Pt overlayer at the surface. The structure formed on these types of alloys2 is further elucidated using a Gd/Pt(111) single crystal. The alloy was prepared in UHV by depositing 150 Å of Gd followed by annealing, thus simulating a bulk single crystal. It was characterized in vacuo using low energy electron diffraction, ion scattering spectroscopy, X-ray photoelectron spectroscopy and temperature programmed desorption of CO. Subsequently, the crystal was transferred to an electrochemical cell, where a 1 nm thick Pt overlayer was formed; this constitutes the active phase for oxygen reduction. Using synchrotron based grazing X-ray diffraction, we determine the structure of the alloy and the Pt overlayer. The diffraction contributions from the Pt overlayer is separated from the Pt5Gd alloy, and the analysis of both diffraction patterns are presented. By investigating such well-defined structures, we gain valuable scientific insight into the relationship between their structure and functionality. On the basis of this insight, we can develop even better catalysts for oxygen electroreduction. References 1. Chen, C. et al. Highly Crystalline Multimetallic Nanoframes with Three-Dimensional Electrocatalytic Surfaces. Science 343, 1339–1343 (2014). 2. Escudero-Escribano, M. et al. Pt5Gd as a Highly Active and Stable Catalyst for Oxygen Electroreduction. J. Am. Chem. Soc. 134, 16476–16479 (2012). 3. Velazquez-Palenzuela, A. et al. The enhanced activity of mass-selected PtxGd nanoparticles for oxygen electroreduction. J. Catal. [in press] (2015).
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Mini-chromosomes among danish Candida glabrata isolates originated through two different mechanisms

We analyzed 201 strains of the pathogenic yeast Candida glabrata from patients, mainly suffering from systemic infection, at Danish hospitals during 1985 – 1999. Our analysis showed that these strains were closely related but exhibited large karyotype polymorphism. Nine strains contained mini-chromosomes, which were smaller than 0.5 Mb. Regarding the year, patient and hospital, C. glabrata strains had independent origin and the analyzed mini-chromosomes were structurally not related to each other (i.e., they contained different sets of genes). We inferred two mechanisms involved in their origin: (i) through a segmental duplication which covered the centromeric region, and (ii) by a translocation event moving a larger chromosome arm to another chromosome that leaves the centromere part with the shorter arm. The first type of mini-chromosomes carrying duplicated genes exhibited mitotic instability, while the second type, which contained the corresponding genes in only one copy in the genome, was mitotically stable. Apparently, in patients C. glabrata chromosomes are frequently reshuffled resulting in various genetic configurations, including appearance of mini-chromosomes. Such new combinations could have increased fitness in a certain patient “environment”.

General information
State: Published
Organisations: DTU Admission Course, Department of Systems Biology, Department of Applied Chemistry, Department of Microbiology, Lund University, Regionshospitalaet Herning
Authors: Ahmad, K. M. (Ekstern), Ishchuk, O. (Ekstern), Hellborg, L. (Ekstern), Jørgensen, G. (Ekstern), Skvarc, M. (Ekstern), Stenderup, J. (Forskerdatabase), Jørck-Ramberg, D. (Intern), Polakova, S. (Ekstern), Piskur, J. (Intern)
Pages: 159-159
Publication date: 2012
Main Research Area: Technical/natural sciences

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Journal: Mycoses
Volume: 55
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BFI (2018): BFI-level 1
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Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): SJR 1.003 SNIP 1.033 CiteScore 2.31
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.903 SNIP 1.072 CiteScore 2.16
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.825 SNIP 0.974 CiteScore 1.82
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.622 SNIP 0.99 CiteScore 1.61
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.533 SNIP 0.934 CiteScore 1.52
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.574 SNIP 1.097 CiteScore 1.77
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.559 SNIP 1.101
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 0.574 SNIP 1.218
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.688 SNIP 1.259
Scopus rating (2007): SJR 0.585 SNIP 0.97
Temaer i Dansk

General information
State: Published
Organisations: DTU Admission Course
Authors: Knudsen, J. S. (Intern)
Number of pages: 200
Publication date: 2008

Publication information
Place of publication: Ballerup
Publisher: Ingeniørhøjskolen i København
Original language: Danish
Main Research Area: Technical/natural sciences
Publication: Education › Compendium/lecture notes – Annual report year: 2008

Idéhistoriske noter

General information
State: Published
Organisations: DTU Admission Course
Authors: Kristensen, J. Ø. (Intern)
Number of pages: 100
Publication date: 2001

Publication information
Place of publication: Ballerup
Publisher: Ingeniørhøjskolen i København
Edition: 2
Original language: Danish
Main Research Area: Technical/natural sciences
Publication: Education › Compendium/lecture notes – Annual report year: 2008

Projects:

Mechanical and microstructural transients after strain path changes in metal forming

Department of Mechanical Engineering
Materials and Surface Engineering
DTU Admission Course
Manufacturing Engineering
Period: 01/03/2014 → 06/06/2017
Number of participants: 3
Project participant:
Jensen, Mikkel Ravn Boye (Intern)
Winther, Grethe (Intern)
Bay, Niels Oluf (Intern)

Relations
Parent project:
Multi-scale material models for smart metal forming
Project
Multi-scale material models for smart metal forming

Analysis of deformation-induced intragranular orientation spread in IF-steel by a combination of 3DXRD and crystal plasticity

Department of Mechanical Engineering
Materials and Surface Engineering
Department of Physics
Neutrons and X-rays for Materials Physics
Manufacturing Engineering

DTU Admission Course

University of Illinois
Period: 01/02/2014 → 31/07/2017
Number of participants: 5
Acronym: MulMatMod
Number of related Ph.D. students: 2
Project participant:
Winther, Grethe (Intern)
Oddershede, Jette (Intern)
Bay, Niels Oluf (Intern)
Juul, Nicolai Ytterdal (Intern)
Jensen, Mikkel Ravn Boye (Intern)

Relations
Related projects:
Characterisation and modelling of crystallographic orientation changes at the grain scale during plastic deformation
Mechanical and microstructural transients after strain path changes in metal forming
Activities:
Analysis of deformation-induced intragranular orientation spread in IF-steel by a combination of 3DXRD and crystal plasticity
Intragranular orientation spread induced by grain interaction
Grain-scale investigations of deformation and surface treatment of stainless steel
Deformation-induced intragranular orientation spread in ferrite investigated by 3DXRD and forward modeling
Combining crystal plasticity and dislocation theory to model dislocation boundary characteristics
Intragranular orientation spread induced by grain interaction
Analysis of grain-scale experimental data in a crystal plasticity framework
Measured Resolved Shear Stresses on Slip Systems in Austenitic Steel Grains
Publications:
Analysis of deformation-induced intragranular orientation spread in IF-steel by a combination of 3DXRD and crystal plasticity
Deformation-induced orientation spread in individual bulk grains of an interstitial-free steel

Activities:

Rekruttering af unge (mænd) til ingeniørudannelse i Region Sjælland: Knudepunkter til overvejelse og diskussion
Period: 17 Nov 2011
Jesper Stensbo Knudsen (Speaker)

DTU Admission Course

Description
Diskussion af centrale problemstillinger i forbindelse med rekrutteringsprojekt i Region Sjælland, IMODUS. København, Danmark.
Documents:
abstract
Related external organisation

**Faggruppesekretær**
Period: 26 Aug 2010 → …
Hanne Lindgreen Frimurer (Other)
DTU Admission Course

**Unknown external organisation**
Activity: Talks and presentations › Conference presentations

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**Ingeniørhøjskolen i København**

**Denmark**
Activity: Other

---

**Lektorbedømmelse (External organisation)**
Period: 26 Apr 2009 → 24 May 2009
Jesper Stensbo Knudsen (Participant)
DTU Admission Course

**Description**
Bedømmelsesudvalg
Body type: Andet

**Related external organisation**

**Lektorbedømmelse**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

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**AK-lederforsamlingen (External organisation)**
Period: 22 Mar 2009 → …
Jesper Stensbo Knudsen (Chairman)
DTU Admission Course

**Description**
Forening af studieledere ved Adgangskurser til ingeniøruddannelserne i Danmark

**Related external organisation**

**AK-lederforsamlingen**
Activity: Membership › Membership of committees, commissions, boards, councils, associations, organisations, or similar

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**Fra Tolerance til Respekt**
Period: 26 Apr 2008
Jesper Stensbo Knudsen (Speaker)
DTU Admission Course

**Description**
Diskussion af centrale begreber inden for interkulturel kommunikation med L. Wittgenstein og H-G. Gadamer som baggrund. Malmö, Sverige

**Related external organisation**

**Unknown external organisation**
Activity: Talks and presentations › Conference presentations
En filosofisk fantasi over Rafaels "Skolen i Athen": Diltheys "Drøm" (1903)
Period: 28 Sep 2007
Jens Østergaard Kristensen (Lecturer)
DTU Admission Course

Description
Den tyske filosof og åndshistoriker Wilhelm Dilthey (1833-1911) holdt ved sin 70 års fødselsdag en tale, "Drøm", hvor han med udgangspunkt i en drøm, han engang havde haft om Rafaels fresko "Skolen i Athen", prøvede at sammendrage det vigtigste i sin filosofi. Ebeltoft, Danmark

Related external organisation

Unknown external organisation
Activity: Talks and presentations › Conference presentations

Skriftlig eksamen i dansk
Period: 1 Jan 2007 → 31 Dec 2008
Jesper Stensbo Knudsen (Other)
DTU Admission Course

Description
Stille opgaver til skriftlig eksamen

Opgavestiller til skriftlig eksamen i dansk

Related organisation

Skriftlig eksamen i dansk
Knudsen, J. S. (Other)
1 Jan 2007 → 31 Dec 2008
Activity: Other