

# Corrosion News



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[www.matcorr.com](http://www.matcorr.com)

## Community News

### Analytica 2020: New instruments for battery research

Researchers all over the world are working on powerful batteries for the energy revolution. Modern analysis technology is indispensable for this. Analytica therefore focuses on new devices and methods for battery research. The world's leading trade fair for laboratory technology, analysis and biotechnology with accompanying analytica conference will take place from March 31 to April 03, 2020, on the fairgrounds of Messe München.

Lithium-ion batteries are used in electric cars, smartphones and many other mobile devices. Nevertheless, they have various disadvantages—from questionable ingredients such as cobalt to flammability and self-discharge. Researchers around the world are therefore working to optimize lithium-ion batteries, or to develop alternatives such as sodium ion batteries. For this, they need the latest analytical methods.

“Many equipment manufacturers have recognized the urgency in battery and power research and specified their systems accordingly,” explains *Susanne Grödl*, Exhibition Director analytica at Messe

München. analytica presents the entire gamut of analysis systems that contribute to further development of storage technology for electric energy. The recently published “Trend Report Battery and E-Mobility” also provides information on highlights from battery research.

#### *Technologies for better batteries*

Anyone who wants to develop better batteries must understand the processes inside the cell. For example, the ageing of the electrolyte, that conductive medium between the two electrodes, is crucial for the safety, service life and performance of a battery. In particular, spectroscopic methods and the coupling of chromatography and mass spectrometry are being used by researchers to investigate which undesirable substances are produced during electrolyte ageing. Based on this knowledge, more stable electrolytes and new electrolyte additives are developed.

The electrodes likewise change over time. In lithium-ion batteries, for example, branch-like lithium protrusions, so-called dendrites, can form on the negative electrode. They are considered to be a causative factor of internal short circuits and battery fires. Microscopy methods—from light microscopy to extremely high-resolution atomic force microscopy—make dendrites visible and provide information for the development of

safe batteries. Surface-sensitive techniques such as ATR-FTIR spectroscopy and Raman imaging also identify alterations and deposits on the electrodes.

In addition, battery research needs devices for determination of physical parameters. Surface measuring instruments, for example, support electrode design, because large electrode surfaces increase battery capacity and allow rapid charging. Calorimeters, in turn, can be used to investigate the heat emission of batteries, which is related to self-discharge.

#### *Instruments for battery research at analytica*

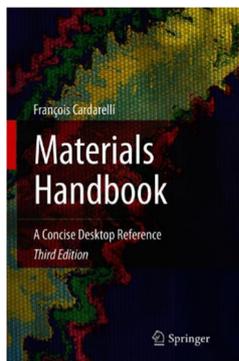
At analytica, interested parties can find out which analysis method is best suited to a specific problem. Instruments for battery research are offered by Bruker, Metrohm, Thermo Fisher Scientific, Shimadzu and many other exhibitors.

“Battery research is innovative cutting-edge research that requires cutting-edge analysis systems,” emphasizes analytica's Exhibition Director *Grödl*. To ensure that new instruments meet the high requirements, in the development of many instruments manufacturers and users collaborate closely. *Grödl* emphasizes: “Analytica sees itself as a driving force behind such cooperations. We are therefore delighted that all leading suppliers of analysis

systems will be presenting their innovations at analytica.”

For further information, please contact: Messe München, Tel.: + 49 89 949-20421, frank.fleschner@messe-muenchen.de, www.analytica.de  
-CNE0220

## Books



**Materials Handbook – A Concise Desktop Reference**, *François Cardarelli*, 3<sup>rd</sup> edition, 2254 pages, 105 figures, 757 tables, Springer International Publishing AG, Cham Switzerland 2018, 407 €, ISBN: 978-3-319-38923-3 (ebook: 978-3-319-38925-7)

This concise reference book, consisting of 2 volumes, provides “key scientific and technical properties and data” for “materials scientists, metallurgists, engineers, chemists, and physicists as well as academic staff, technicians, and students” dealing with such kind of materials.

Within its 3<sup>rd</sup> edition the previous work was extended by a chapter on occupational health and safety issues of materials, beside of the update of whole content.

Within 22 chapters materials properties and data are summarized in many tables. Some facts are illustrated by drawings and diagrams for better understandability. Each

chapter ends with a part on further reading arranged accordingly.

The first chapter describes physical, mechanical, acoustical, thermal, optical and other properties of the materials as well as fundamental constants and conversion factors.

Chapter 2 is dedicated to ferrous metals and their alloys, followed by common (aluminum, copper, zinc and tin) and less common non-ferrous (alkali, alkaline earth, refractory, noble, rare earth and others) metals. Beside of material specific data other interesting facts, like occurrence, production and preparation are provided.

In chapter 5 band theory, classification, properties and processing are described and shown on examples common semiconductors, like Silicon, Germanium and Boron.

Properties and types of superconductors are presented together with some excurses on relevant theory and effects in the next chapter, followed by 40 pages on magnetic materials. Relevant behavior and mechanisms as well as physical quantities are the content of the chapter on insulators and dielectrics.

Interesting for electrochemists is chapter 9 on miscellaneous electrical materials, since here electrodes and their potentials are treated.

The next parts contain relevant data for ceramics, refractories and glasses, polymers and elastomers, minerals, ores and gemstones, rocks and meteorites, soils and fertilizers, cements, concrete, building stones and construction materials, timbers and woods, fuels, propellants and explosives as well as composites. Next chapters are a bit more general: gases and liquids, followed by food materials. Last group is nuclear materials with topics like stability, models, radioactivity radiolysis, dosimetry, and reactions occurring in reactors.

The book ends with the already mentioned new chapter on toxic and poisonous substances, highly flammable and strongly reactive materials, cryogenic fluids, steam, molten materials and briefly with the classification according to GHS.

Within the appendix a lot of helpful tables complete the book, whereas the last table refers to some materials societies.

-CBE0320

*Ralph Bäßler*

## Conferences

### Corrosion in the oil and gas industry

May 20 - 22, 2020, Saint Petersburg (Russia)

One of the key challenges facing the international community of oil and gas producing and processing companies is the development of complex, often non-standard approaches to improving the reliability of equipment and protecting materials from the aggressive effects of operating conditions.

The international conference “Corrosion in the oil and gas industry 2019” was devoted to these issues. The conference became a landmark event on the international agenda and was included in the list of official events of the European Corrosion Federation. More than 350 participants from 20 countries, 130 reports, as well as broad support from the largest international representatives of science and industry confirm the need for the industry to hold this event annually.

From 20 to 22 may 2020, the 2<sup>nd</sup> international Conference “Corrosion in the oil and gas industry” will be held. The organizers provide an even greater number of business events with the opportunity to talk about their

solutions and discuss current problems of the industry in the circle of the international professional community.

The upcoming conference, organized by Peter the Great St. Petersburg Polytechnic University together with the society of corrosion engineers NACE International, will be devoted to the reliability of equipment of oil and gas industry facilities. Scientists, specialists and engineers from different countries will talk about the latest technologies in the field of corrosion protection, innovative materials for capital construction of infrastructure in the Arctic, the shelf, approaches to monitoring and studying the mechanisms of corrosion.

For more information, please contact: NACE International, Project manager *Valentina Ivanova*, Tel.: +7 911 238 8301 [corrosionrussia@onlinereg.ru](mailto:corrosionrussia@onlinereg.ru), [www.corrosionrussia.org](http://www.corrosionrussia.org) –CCE0720

## ChinaCorr 2020

June 10 - 12, 2020, Beijing (China)

ChinaCorr 2020 organized by NACE International and the Chinese Petroleum Society:

- Provides an international technology exchange platform for petroleum, petrochemical and related industries in the field of corrosion control and protection;
- Brings together experts from various countries to study and seek solutions to protect people, asset

and environment from the adverse effects of corrosion;

- Helps petroleum and petrochemical enterprises address the pressing corrosion challenges in exploration and development, oil and gas pipeline network, refining and other fields; and
- Strengthens the research and application of new technologies and methods in the field of corrosion prevention.

### Who Should Attend

- Corrosion engineers
- Engineers who involve in oil, gas, pipeline, refining, offshore & marine, pressure equipment and non-metallic materials
- Consultants
- Inspectors
- Oil & Gas owners and operators
- Pipeline owners and operators.

For more information, please contact: NACE International, Houston, Texas, USA, [reygie.deborja@nace.org](mailto:reygie.deborja@nace.org), [www.chinacorr.nace.org](http://www.chinacorr.nace.org) –CCE0820

## FGLA Colloquium “Failure Mechanisms and Reliability of Electrical Drive Trains – Power Electronics, Batteries, Drives”

September 23, 2020, Aachen (Germany)

The FGLA colloquium 2020 is an interdisciplinary platform for industry and university to present and exchange research and development trends on reliable energy conversion and storage systems.

A special focus of this colloquium are the degradation mechanisms and lifetime prediction of state-of-the-art batteries (lithium-ion). This topic is of major importance for the whole value chain: it helps evaluating the cells from production of the energy storages, first life use and system design, as well as second life concepts and life cycle analyses. Trends in aging research, lifetime prediction and the subsequent parameterization of models and adoption of BMS algorithms will be presented within the broader context of battery research in Germany.

The colloquium is organized by the institute of power electronics and electrical drives (ISEA) of RWTH Aachen University and takes place on the 23<sup>rd</sup> September 2020 in Aachen. It is chaired by Prof. *Rik W. De Doncker*, Prof. *Dirk Uwe Sauer* and Prof. *Egbert Figgemeier*.

For more information, please contact: the Institute of power electronics and electrical drives (ISEA) of RWTH Aachen University, Prof. *Dirk Uwe Sauer*, [veranstaltungen@isea.rwth-aachen.de](mailto:veranstaltungen@isea.rwth-aachen.de), [www.isea.rwth-aachen.de](http://www.isea.rwth-aachen.de)

–CCE0920

# Calendar of Events

 New Entry

 Conference/Workshop/Symposium

 Fair

 Course

<b>April 2020</b>		
<b>20. – 23.4.</b> Duisburg (Germany)	 <b>Cokemaking</b>	Stahl-Akademie - Stahlinstitut VDEh Düsseldorf Germany info@stahl-akademie.de www.stahl-akademie.de
<b>21. – 24.4.</b> Karlsruhe (Germany)	 <b>PaintExpo</b> 	FairFair GmbH Oberboihingen Germany beck@fair.de www.fairfair.de
<b>26. – 29.4.</b> Köln (Germany)	 <b>Refractory Technology – Applications, Wear Mechanism and Failures</b>	Stahl-Akademie - Stahlinstitut VDEh Düsseldorf Germany info@stahl-akademie.de www.stahl-akademie.de
<b>28. – 29.4.</b> Karlsruhe (Germany)	 <b>4<sup>th</sup> Hybrid Materials and Structures 2020</b>	INVENTUM GmbH Sankt Augustin Germany hybrid@dgm.de www.hybrid2020.inventum.de
<b>May 2020</b>		
<b>3. – 5.5.</b> Queretaro (Mexico)	 <b>Heat Treat Mexico: Advanced Thermal Processing Technology Conference and Expo</b> 	ASM International memberservicecenter@asminternational.org www.asmiinternational.org
<b>4. – 5.5.</b> Köln (Germany)	 <b>1<sup>st</sup> International Seminar Hydrogen-based Reduction of Iron Ores</b>	Stahl-Akademie - Stahlinstitut VDEh Düsseldorf Germany info@stahl-akademie.de www.stahl-akademie.de
<b>4. – 6.5.</b> Palm Springs, CA (USA)	 <b>31<sup>st</sup> AeroMat Conference and Exposition</b> 	ASM International memberservicecenter@asminternational.org www.asmiinternational.org

<p><b>10. – 14.5.</b> São Paulo (Brazil)</p> 	<p><b>21<sup>st</sup> International Corrosion Congress &amp; 8<sup>th</sup> International Corrosion Meeting</b></p>	<p>Brazilian Corrosion Association (ABRACO) eventos@abraco.org.br coordenacao.eventos@abraco.org.br www.icc-congress2020.com</p>
<p><b>10. – 15.5.</b> Les Embiez Island (France)</p> 	<p><b>High Temperature Corrosion and Protection of Materials (HTCPM)</b></p>	<p>INPT - SAIC "HTCPM2020" Toulouse France htcpm2020@inp-toulouse.fr www.htcpm2020.com</p>
<p><b>12. – 14.5.</b> Marseille (France)</p>  	<p><b>COFREND</b></p>	<p>Confédération Française pour les Essais Non Destructifs Paris France pole.communication@cofrend.com www.cofrend.com</p>
<p><b>20. – 22.5.</b> Saint Petersburg (Russia)</p> 	<p><b>2<sup>nd</sup> International Conference "Corrosion in the oil &amp; gas industry"</b></p>	<p>Prof. <i>Vladimir Polyanskiy</i> Director, Head of Applied Research Laboratory, Institute for Problems in Mechanical Engineering of the Russian Academy of Sciences, St. Petersburg Russia polyanskiy@spbstu.ru www.corrosionrussia.org</p>
<p><b>25. – 27.5.</b> Dortmund (Germany)</p> 	<p><b>Steel Ladle Lining</b></p>	<p>Stahl-Akademie - Stahlinstitut VDEh Düsseldorf Germany info@stahl-akademie.de www.stahl-akademie.de</p>
<p><b>26. – 28.5.</b> Potsdam (Germany)</p> 	<p><b>4<sup>th</sup> International Symposium for Fatigue Design and Materials Defects</b></p>	<p>INVENTUM GmbH Sankt Augustin Germany fdmd@inventum.de www.fdmd2020.inventum.de</p>
<p><b>June 2020</b></p>		
<p><b>2. – 3.6.</b> Saint Louis, MO (USA)</p> 	<p><b>Nondestructive Evaluation of Aerospace Materials &amp; Structures 2020</b></p>	<p>American Society for Nondestructive Testing International Service Center Columbus, OH USA www.asnt.org</p>
<p><b>8. – 9.6.</b> Tokyo (Japan)</p>  	<p><b>Stainless Steel World Japan 2020</b></p>	<p>Stainless Steel World Zutphen The Netherlands k.ichikawa@kci-world.com www.stainless-steel-world.net</p>
<p><b>8. – 12.6.</b> Seoul (Korea)</p> 	<p><b>20<sup>th</sup> World Conference on Non-Destructive Testing (WCNDT 2020)</b></p>	<p>Korean Society for Nondestructive Testing (KSNT) Seoul Korea secretariat@wcndt2020.com www.wcndt2020.com</p>
<p><b>9. – 11.6.</b> Antibes Juan-les-Pins (France)</p> 	<p><b>7<sup>èmes</sup> Journées Protection Cathodique et Revêtements Associés</b></p>	<p>CEFRACOR www.cefracor.org</p>

<p><b>9. – 11.6.</b> Stockholm (Sweden)</p> 	<p><b>34<sup>th</sup> Assembly of Advanced Materials Congress (AMC)</b></p>	<p>IAAM Ulrika Sweden contact@iaamonline.org www.advancedmaterialscongress.org</p>
<p><b>10. – 12.6.</b> Beijing (China)</p>  	<p><b>ChinaCorr 2020</b></p>	<p>NACE International Houston, Texas USA reygie.deborja@nace.org www.chinacorr.nace.org</p>
<p><b>10. – 12.6.</b> Vienna (Austria)</p> 	<p><b>International Thermal Spray Conference ITSC 2020</b></p>	<p>DVS – German Welding Society Düsseldorf Germany tagungen@dvs-hg.de www.dvs-ev.de</p>
<p><b>14. – 18.6.</b> Milan (Italy)</p>  	<p><b>6<sup>th</sup> International Conference on Steels in Cars and Trucks</b></p>	<p>TEMA Technologie Marketing AG Carsten Scheele Aachen Germany info@sct-2020.com www.sct-2020.com</p>
<p><b>16. – 18.6.</b> Edinburgh (Scotland)</p>  	<p><b>"Structural Faults + Repair-2020 Conference" "European Bridge Conference-2020"</b></p>	<p>Professor <i>Michael C Forde</i> Conference Chair Chair of Civil Engineering Construction, University of Edinburgh editor@structuralfaultsandrepair.com www.structuralfaultsandrepair.com</p>
<p><b>17. – 18.6.</b> Rotterdam (The Netherlands)</p>   	<p><b>Biobased Coatings Europe 2020</b></p>	<p>ACI (Europe) - Active Communications International London United Kingdom jmatthys@acieu.net www.wplgroup.com</p>
<p><b>17. – 19.6.</b> Bari (Italy)</p>  	<p><b>10<sup>th</sup> European Conference on Continuous Casting (ECCC2020)</b></p>	<p>ECCC 2020 Organising Secretariat AIM - Associazione Italiana di Metallurgia Milan Italy aim@aimnet.it www.aimnet.it/eccc2020</p>
<p><b>21. – 25.6.</b> Vienna (Austria)</p>  	<p><b>Galvatech 2020</b></p>	<p>The Austrian Society for Metallurgy and Materials (ASMET) Leoben Austria www.galvatech2020.org</p>
<p><b>22. – 24.6.</b> Dortmund (Germany)</p> 	<p><b>Oxygen Steelmaking</b></p>	<p>Stahl-Akademie - Stahlinstitut VDEh Düsseldorf Germany info@stahl-akademie.de www.stahl-akademie.de</p>
<p><b>22. – 24.6.</b> Berlin (Germany)</p>  	<p><b>LCF9 Ninth International Conference on Low Cycle Fatigue</b></p>	<p>German Association for Materials Research and Testing e. V. (DVM) Berlin Germany dvm@dvm-berlin.de www.dvm-berlin.de</p>

<p><b>22. – 25.6.</b> Athens (Greece)</p>  	<p><b>10<sup>th</sup> Annual International Conference on Civil Engineering</b></p>	<p>Dr. Gregory T. Papanikos President, ATINER Athens Greece atiner@atiner.gr www.atiner.gr</p>
<p><b>23. – 26.6.</b> Dresden (Germany)</p>  	<p><b>21<sup>st</sup> International Symposium on Laser Precision Microfabrication - LPM 2020</b></p>	<p>DGM-Inventum GmbH Sankt Augustin Germany lpm2020@dgm.de www.lpm2020.inventum.de</p>
<p><b>23. – 26.6.</b> Malaga (Spain)</p>  	<p><b>Symposium on Corrosion and Surface Protection Methods - CNMAT 2020</b></p>	<p>Secretaría Técnica Sevilla Spain cnmat2020@bcocongresos.com www.cnmat2020.com</p>
<p><b>30.6. – 3.7.</b> Barcelona (Spain)</p>  	<p><b>15<sup>th</sup> International Conference on Durability of Building Materials and Components DBMC 2020</b></p>	<p>RILEM Paris France dg@rilem.net www.rilem.net</p>
<p><b>July 2020</b></p>		
<p><b>19. – 24.7.</b> Cambridge (United Kingdom)</p> 	<p><b>Advances in Corrosion Protection by Organic Coatings (EFC Event No. 451)</b></p>	<p>European Federation of Corrosion offices@efcweb.org www.efcweb.org</p>
<p><b>August 2020</b></p>		
<p><b>6. – 10.9.</b> Serbia (Belgrade)</p> 	<p><b>ISE Annual Meeting 2020</b></p>	<p>International Society of Electrochemistry Lausanne Switzerland events@ise-online.org www.ise-online.org</p>
<p><b>24. – 26.8.</b> Kansas City, MO (USA)</p>  	<p><b>NACE Central Area Conference 2020</b></p>	<p>NACE International Houston, Texas USA meghan.leyva@nace.org www.nace.org</p>
<p><b>31.8. – 3.9.</b> Cologne (Germany)</p> 	<p><b>Continuous Casting</b></p>	<p>Stahl-Akademie - Stahlinstitut VDEh Düsseldorf Germany info@stahl-akademie.de www.stahl-akademie.de</p>
<p><b>September 2020</b></p>		
<p><b>6. – 10.9.</b> Brussels (Belgium)</p>  	<p><b>EUROCORR 2020</b></p>	<p>European Federation of Corrosion c/o DECHEMA e.V. Frankfurt am Main Germany info@efcweb.org www.eurocorr2020.org</p>

<p><b>6. – 11.9.</b> Garmisch-Partenkirchen (Germany)</p>  	<p><b>17<sup>th</sup> International Conference on Plasma Surface Engineering</b></p>	<p>Europäische Forschungsgesellschaft Dünne Schichten e.V. - EFDS Dresden Germany pse-conferences@efds.org www.pse-conferences.net</p>
<p><b>22. – 25.9.</b> Darmstadt (Germany)</p>  	<p><b>MSE 2020 Materials Science and Engineering Congress</b></p>	<p>Conference Office Deutsche Gesellschaft für Materialkunde e.V. c/o INVENTUM Sankt Augustin Germany mse@mse-congress.de www.mse-congress.de</p>
<p><b>23.9.</b> Aachen (Germany)</p>  	<p><b>FGLA Colloquium “Failure Mechanisms and Reliability of Electrical Drive Trains – Power Electronics, Batteries, Drives”</b></p>	<p>RWTH Aachen Institute of power electronics and electrical drives (ISEA) veranstaltungen@isea.rwth-aachen.de www.isea.rwth-aachen.de</p>
<b>March 2021</b>		
<p><b>22. – 26.3.</b> Bremen (Germany)</p>  	<p><b>10<sup>th</sup> European Coke and Ironmaking Congress (ECIC) and 9<sup>th</sup> International Conference on Science and Technology of Ironmaking (ICSTI)</b></p>	<p>TEMA Technologie Marketing AG Carsten Scheele Aachen Germany info@ecic-icsti-2021.com www.tema.de</p>
<b>April 2021</b>		
<p><b>18. – 22.4.</b> Salt Lake City, UT (USA)</p>   	<p><b>CORROSION 2021</b></p>	<p>NACE International Houston, Texas USA meghan.leyva@nace.org www.nace.org</p>
<b>June 2021</b>		
<p><b>14. – 18.6.</b> Frankfurt (Germany)</p>  	<p><b>ACHEMA 2021</b></p>	<p>DECHEMA e.V. Frankfurt am Main Germany info@dechema.org www.achema.de</p>
<b>September 2021</b>		
<p><b>13. – 17.9.</b> Aachen (Germany)</p>  	<p><b>9<sup>th</sup> European Oxygen Steelmaking Conference (EOSC) and 6<sup>th</sup> Clean Technologies in the Steel Industry (CTSI)</b></p>	<p>Steel Institute VDEh Dr.-Ing. Hans Bodo Lüngen Düsseldorf Germany info@eosc-ctsi-2021.com www.eosc-ctsi-2021.com</p>
<p><b>19. – 23.9.</b> Budapest (Hungary)</p> 	<p><b>EUROCORR 2021</b></p>	<p>European Federation of Corrosion c/o DECHEMA e.V. Frankfurt am Main Germany info@efcweb.org www.eurocorr2021.org</p>

<b>March 2022</b>		
<b>6. – 10.3.</b> San Antonio, TX (USA)	  	<b>CORROSION 2022</b>  NACE International Houston, Texas USA meghan.leyva@nace.org www.nace.org
<b>August 2022</b>		
<b>28.8. – 1.9.</b> Berlin (Germany)		<b>EUROCORR 2022</b>  European Federation of Corrosion c/o DECHEMA e.V. Frankfurt am Main Germany info@efcweb.org www.eurocorr2022.org
<b>March 2023</b>		
<b>19. – 23.3.</b> Denver, CO (USA)	  	<b>CORROSION 2023</b>  NACE International Houston, Texas USA meghan.leyva@nace.org www.nace.org
<b>September 2023</b>		
<b>3. – 7.9.</b> Dresden (Germany)	  	<b>EUROMAT 2023</b>  DGM-Inventum GmbH Sankt Augustin Germany dgm@dgm.de www.dgm.de