13th International Symposium on Hazards, Prevention and Mitigation of Industrial Explosions (ISHPMIE 2020)

Physikalisch-Technische Bundesanstalt (PTB), Braunschweig, Germany

Program of the ISHPMIE 2020 Forum (July 28, 2020)

July 27 – 31, 2020

Welcome to ISHPMIE 2020 Forum

Greetings from the President of PTB, the host organization

Joachim Ullrich

Greetings from the International Organizing Committee

Trygve Skjold

Greetings form the Local Organizing Committee Chair

Michael Beyer

Session 01: Advances in explosion protection: Strategies, measures, and protective equipment (1)

Session Chair: Trygve Skjold

Laboratory Development and Pilot-scale Deployment of a Two-part Foamed Rock Dust

Connor B. Brown, Inoka E. Perera, Marcia L. Harris, Linda L. Chasko, James D. Addis & Scott Klima (#921)

Assessment of Release Mitigation of Water-Reactive Chemicals by Absorbents

Ting-Jia Kao, Thanh-Trung Nguyen, Yu-Jhen Lin, Zhi-Xuan Lin, Hsiao-Yun Tsai, Jenq-Renn Chen (#963)

Modeling of Explosion Dynamics in Vessel-Pipe Systems to Evaluate Performance Limitations of Explosion Isolation Systems

Lorenz R. Boeck, C. Regis Bauwens & Sergey B. Dorofeev (#969)

Session 02: Advances in explosion protection: Strategies, measures, and protective equipment (2)

Session Chair: Detlev Markus

CEQAT-DGHS interlaboratory tests for chemical safety: Validation of laboratory test methods by determining the measurement uncertainty and probability of incorrect classification including so-called “Shark profiles”

Peter Lüth, Steffen Uhlig, Kirstin Frost, Marcus Malow, Heike Michael-Schulz, Martin Schmidt & Sabine Zakel (#994)

Physical and Mathematical Modelling of Interaction of Detonation Waves with Inert Gas Plugs

Dmitry Tropin & Igor Bedarev (#908)

Boundary Conditions and Grid Dependency in CFD Simulation of Atmospheric Flow

Henry Plischka, Johann Turnow & Nikolai Kornev (#1007)

Session 06: Explosion modelling and simulation (2)

Session Chair: Josué Melguizo-Gavilanes

Numerical modelling of the effects of vessel length-to-diameter ratio (L=D) on pressure piling

Damilare Ogungbemide, Martin P. Clouthier, Chris Cloney, Robert G. Zalosh, Robert C. Ripley, & Paul R. Amyotte (#943)

A computational framework for electrification of turbulent liquid flows

Mathieu Calero, Holger Grosshans & Miltiadis V. Papalexandris (#1027)

CFD-based simulation of flammable gas dispersion in a complex geometry

Miroslav Mynarz, Aleš Tulach, Petr Lepík & Milada Koubkov (#1030)

Session 07: Explosion modelling and simulation (3)

Session Chair: Holger Großhans

A Eulerian model for dust deflagrations, including inner particle effects

Christoph Spijker, & Harald Raupenstrauch (#902)

CFD Simulation of an Unconfined Vapor Cloud Explosion through obstacles using OpenFoam®

Cléante Langrée, Erwin Franquet, Julien Reveillon, Guillaume Lecocq & François-Xavier Demoulin (#939)

Understanding the role of thermal radiation in dust flame propagation

Christophe Proust & Rim Ben Moussa (#959)

Session 08: Explosion modelling and simulation (4)

Session Chair: Paola Russo

Impact of photovoltaic power plants on far-field effects of UVCEs

Guillaume Lecocq, Antoine Dutertre & Emmanuel Leprette (#912)

Influence of Thermal Radiation on Layered Dust Explosions

Swagnik Guhathakurta & Ryan W. Houim (#1012)

Determination of reaction mechanisms for the gasification and explosion of organic powders

Matteo Pietraccini, Eloise Delon, Audrey Santandrea, Stéphanie Pacault, Pierre-Alexandre Glaude, Anthony Dufour & Olivier Dufaud (#1019)

Session 09: Explosion prevention (1)

Session Chair: Hannes Kern

Effect of multiple vent characteristic parameters on external explosion induced by indoor premixed methane-air explosion
Lei Pang, Qianran Hu, Yang Hu, Pengfei Lv & Kai Yang (#933)

Keeping the Overview on Surface Resistivity Measurements

Aaron D. Ratschow, Sigrun Stein & Hans-Jürgen Gross (#945)

A new technique to produce well controlled electrical sparks. Application to MIE measurements

Christophe Proust (#960)

25 years of ATEX directive: the real role of each Stakeholder

Michał Górny & Xavier Lefebvre (#996)

Session 10: Explosion prevention (2)

Session Chair: Paul Amyotte

Investigation on limiting oxygen concentration of combustible gas for safety control during air injection process

Pengliang Li, Zhenyi Liu, Mingzhi Li, Yao Zhao, Xuan Li (#932)

Measurement of the deposit formation during pneumatic transport of polydisperse PMMA powder

Nuki Susanti, Holger Grosshans (#896)

Suppression effect of inert gas on aluminum dust explosion

Shulin Zhang, Mingshu Bi, Haipeng Jiang, Wei Gao (#983)

Session 11: Explosion properties of substances and mixtures (1)

Session Chair: Jan Berghmans

Homogeneity of methane-air mixture in devices for the determination of explosion limits

Eliška Fišerová, Jan Karl (#910)

Enhanced Friction and Shock Sensitivities of Hexachlorodisilane Hydrolyzed Deposit Mixed with KOH

Thanh-Trung Nguyen, Yu-Jhen Lin, Zhi-Xuan Lin, Hui-Chu Tai, Chun-Yi Lee, Hsiao-Yun Tsai, Jenq-Renn Chen & Eugene Y. Ngai (#916)

Preliminary Study of Lignocellulosic biomass ignition properties estimation from Thermogravimetric Analysis

Blanca Castells, Isabel Amez, Ljiljana Medic, Nieves Fernandez-Anez & Javier Garcia-Torrent (#941)

Burning and explosion behaviour of ethanol/water -sucrose mixtures

Maria Mitu, Thomas Stolz, Elisabeth Brandes & Sabine Zakel (#1005)

Session 12: Explosion properties of substances and mixtures (2)

Session Chair: Jenq-Renn Chen

Flammability characteristics of methane enriched with H_2 using CO_2 in the Spark Test Apparatus

Isabel Amez, Blanca Castells, Ljiljana Medic & Javier Garcia-Torrent (#942)

Do nanostructured materials influence the ignition behavior of combustible dust?

Susanne Hacke (#955)

Nex-Hys – Minimum Ignition Temperature of Hybrid Mixtures

Dieter Gabel, Paul Geoerg, Fabian Franken & Ulrich Krause (#966)

A Thermal Model for the Minimum Ignition Energy of Dusts

Tengfei Chen, Jan Berghmans, Jan Degrève, Filip Verplaetsen, Jo Van Caneghem & Maarten Vanierschot (#988)

Session 13: Explosion testing

Session Chair: Robert Zalosh

Safety Related Properties of Tetrafluoroethylene Research on the Explosive Decomposition on an Industrial Scale

Christian Liebner, Volkmar Schröder & Martyn J. Shenton (#950)

Influence of thermal shock of piezoelectric pressure sensors on the measurement of explosion pressures

Tim Krause, Mirko Meier & Jens Brunzendorf (#953)

Modifications of the Standard 1m3 Vessel in Search of Adequate Values of the Maximum Rate of Pressure Rise

Wojciech Adamus, Adrian Toman (#979)

Turbulence in real flammable gas releases

Didier Jamois, Christophe Proust, Jérôme Hébrard, Emmanuel Leprette, Helene Hisken, Lorenzo Mauri, Gordon Atanga, Melodia Lucas, Kees van Wingerden, Trygve Skjold, Pierre Quillatre, Antoine Dutertre, Thibault Marteau, Andrzej Pekalski, Lorraine Jenney, Dan Allason & Mike Johnson (#1010)

Session 14: Explosions of sprays and vapors

Session Chair: Olivier Dufaud

Charge-separating processes by spraying water under high pressure

Florian Baumann, Matthias Himstedt, Dieter Möckel & Martin Thedens (#905)

Presentation of the experimental JIP SPARCLING: Inside and beyond a pressurised LNG release

Lauris Joubert, Guillaume Leroy, Steven Betteridge, Elena Vyazmina, Laurence Bernard, Romain Jambut & Jérôme Frindel (#934)

Hydrocarbon aerosol explosion: towards hazardous area classification

Stephanie El-Zahlanieh, Augustin Charvet, Alexis Vignes, Benoit Tribouilloy & Olivier Dufaud (#1021)

Session 15: Flame propagation and acceleration (1)

Session Chair: Wookyung Kim

On an Assessment of Dust Explosion Dynamics in the Standard 20-l Sphere

Zdzisław Dyduch (#981)

Ignition Temperatures and Flame Velocities of Metallic Nanomaterials

Arne Krietsch, Monica Reyes Rodriguez, Andor Kristen, Daniel Kadoke, Zaheer Abbas & Ulrich Krause (#949)

A flame propagation model for nanopowders

Audrey Santandrea, David Torrado, Matteo Pietraccini, Alexis Vignes, Laurent Perrin & Olivier Dufaud (#957)

Session 16: Flame propagation and acceleration (2)

Session Chair: Jennifer Wen

Construction of a 4 m long test rig for experimental investigations on flame propagation in combustible dust/air mixtures

Katja Hüttenbrenner, Hannes Kern, Florian Toth, Julian Glechner & Harald Raupenstrauch (#956)

Self-similar propagation of expanding spherical flames in lean hydrogen-air mixtures

Wookyung Kim, Takumi Namba, Tomoyuki Johzaki & Takuma Endo (#993)

Assessing the influence of real releases on explosions: selected results from large-scale experiments

Helene Hisken, Lorenzo Mauri, Gordon Atanga, Melodia Lucas, Kees van Wingerden, Trygve Skjold, Pierre Quillatre, Antoine Dutertre, Thibault Marteau, Andrzej Pekalski, Lorraine Jenney, Dan Allason, Mike Johnson, Emmanuel Leprette, Didier Jamois, Jérôme Hébrard & Christophe Proust (#1015)

Session 17: Gas, dust, and hybrid mixture explosions (1)

Session Chair: Dieter Gabel

Investigations on the effect of particle size on dust dispersion in MIKE 3 apparatus

Yangyue Pan, Christoph Spijker, Hannes Kern & Harald Raupenstrauch (#906)

Numerical investigation of overdriving in the 20-L Siwek chamber

Martin P. Clouthier, Damilare Ogungbemide, Chris Cloney, Robert G. Zalosh, Robert C. Ripley & Paul R. Amyotte (#909)

Prenormative Study on the Safety Characteristics of Explosion Protection for Hybrid Mixtures of Dusts and Vapours

Vanessa Heilmann, Adeyemi Taiwo, Werner Hirsch, Holger Grosshans, Sabine Zakel & Ulrich Krause (#920)

The Explosion of Non-nano Iron Dust Suspension in the 20-l Spherical Bomb

Enrico Danzi, Gianmaria Pio, Luca Marmo & Ernesto Salzano (#947)

Session 18: Gas, dust, and hybrid mixture explosions (2)

Session Chair: Jérôme Taveau

Minimum Ignition Energy of Hybrid Mixture of LDPE Powder with Ethylene below the gas Lower Explosive Limit

Lei Pang, Yu Zhao, Jiaojiao Cao, Chunmiao Yuan, Pengfei Lv & Zhiwen Zhang (#929)

An investigation of micron and nano scale of aluminium dust explosion

Po-Jul Chang, Toshio Mogi & Ritsu Dobashi (#927)

Vented Dust Explosion through the Bent Duct

Lei Pang, Zhiwen Zhang, Shiqi Cui, Xinrui Zhu, Jiaxin Yin (#928)

Minimum Ignition Energy of Coal Dust Clouds in air and O_2/CO_2 Atmospheres with Small Amount of CH_4/H_2

Dejian Wu, Arne Krietsch, Frederik Norman & Martin Schmidt (#930)

Session 19: Gas, dust, and hybrid mixture explosions (3)

Session Chair: Wei Gao

Modelling of detonation flows in inhomogeneous gas particle suspensions within the framework of the reduced kinetics

Tatyana Khmel & Sergei Lavruk (#971)

Numerical investigation of propagation of heterogeneous detonation in nanodispersed aluminum particle suspensions in expanding channels

Sergey Lavruk, Tatyana Khmel (#974)

A Simple Dust Combustion Model for Characterizing Reactivity in Large-Scale Experiments

C. Regis L. Bauwens, Lorenz R. Boeck & Sergey B. Dorofeev (#1016)

Quasi-static dispersion of dusts for the determination of lower explosion limits of hybrid mixtures

Zaheer Abbas, Olivier Dufaud, Dieter Gabel, Arne Krietsch & Ulrich Krause (#1023)

Session 20: Gas, dust, and hybrid mixture explosions (4)

Session Chair: Christophe Proust

Testing of dust clouds for the electrostatic-spark ignition hazard in industry. Need for a modified approach?

Rolf K. Eckhoff (#998)

Self-ignition tendency of solid fuels: a gas emissions approach for early detection)

Nieves Fernandez-Anez, Blanca Castells-Somoza, Isabel Amez-Arenillas & Javier Garcia-Torrent (#1000)

Behaviour of smouldering fires during periodic refilling of wood pellets into silos

Nieves Fernandez-Anez, Anita Katharina Meyer, Javier Elio Medina, Gisle Kleppe, Bjarne Christian Hagen & Vidar Frette (#1001)

Effect of particle size distribution, drying and milling technique on explosibility behaviour of olive pomace waste

Matteo Pietraccini, Enrico Danzi, Luca Marmo, Albert Addo & Paul Amyotte (#1024)

Session 21: Hydrogen safety

Session Chair: Daniel Banuti

Pressure peaking phenomena: Large-scale experiments of ignited and unignited hydrogen releases

Agnieszka Lach, André Vagner Gaathaug (#892)

Investigation of the correlation between the electrical power and flame front of a discharge caused by a slow contact opening in a H_2/air mixture

Carsten Uber, Bogdan Barbu, Michael Hilbert, Frank Berger, Frank Lienesch (#913)

Spectroscopic investigations of the correlation between the discharge caused by a slow contact opening and the flame front in a H_2/air mixture

Carsten Uber, Steffen Franke, Jens Brunzendorf, Michael Hilbert, Dirk Uhrlandt, Frank Lienesch (#914)

Study on Premixed Hydrogen/air Flame in Channels

Xiaobo Shen, Yun Zhang & Weiguo Cao (#977)

Session 22: Ignition phenomena (1)

Session Chair: Stefan Essmann

New aspects of the ignition of burnable gas mixtures by low-energy electrical discharges

Stefan Essmann, Johann-Robert Kummer, Holger Grosshans, Detlev Markus & Ulrich Maas (#900)

Determination of the ignition temperature of flammable liquids under different initial conditions

Libor Ševčík & Ondřej Suchý (#911)

Comparative study on standardized ignition sources used for explosion testing

Stefan Spitzer, Enis Askar, Arne Krietsch & Volkmar Schröder (#925)

Spontaneous combustion behaviour of solids: Validation of extrapolation of laboratory tests by means of semi technical tests up to 1 m^3 and advanced thermoanalytical methods

Martin Schmidt, René Erdt, Markus Gödde & Steffen Salg (#936)

Low Temperature Autoignition of Jet A and Surrogate Jet Fuels

Conor Martin & Joseph Shepherd (#973)

Session 23: Ignition phenomena (2)

Session Chair: Ritsu Dobashi

Influence of gap length on re-ignition by hot free jets

Franziska Seitz, Jens Brunzendorf, Robert Schießl & Detlev Markus (#952)

Combustion characteristics and kinetic analysis of pine sawdust based on deconvolution and isoconversional method

Xiaomeng Sun & Depeng Kong (#980)

Pyrolysis and Pilot Ignition of PMMA Dust by Constant Conduction

Lei Huang & Wei Gao (#984)

Thermal ignition of n-hexane air mixtures by vertical cylinders

Silken Jones & Joseph Shepherd (#1011)

Ignition delay times of methane/diethyl ether (DEE) blends measured in a rapid compression machine (RCM)

Simon Drost, Marc Werler, Robert Schießl & Ulrich Maas (#1014)

Session 24: Ignition phenomena (3)

Session Chair: Robert Schießl

Simulation of the Flow of an Explosive Atmosphere Exposed to a Hot Hemisphere

Subrahmanyeswara Velagala, Priyank Raval, Sai Charan Singh Chowhan, Ghazaleh Esmaeelzade, Michael Beyer & Holger Grosshans (#915)

Ignition by low energy electrical discharges - Interference of self-generated vortices with the hot gas kernel

Johann-Robert Kummer, Stefan Essmann, Holger Grosshans, Detlev Markus & Ulrich Maas (#946)

Ignition at plane and convex hot surfaces at different spatial orientation

Sai Charan Singh Chowhan, Priyank Raval, Subrahmanyeswara Velagala, Michael Hau, Holger Grosshans & Michael Beyer (#964)

Numerical Studies on Minimum Ignition Energies in Methane/Air and Isooctane/Air Mixtures

Chunwei Wu, Robert Schießl & Ulrich Maas (#1013)