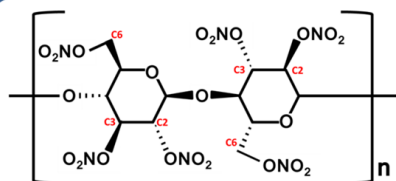


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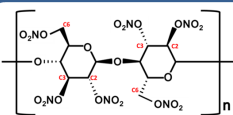
7TH NITROCELLULOSE SYMPOSIUM 2016

CHARACTERIZATION SAFETY PROCESSABILITY PERFORMANCE



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Summary for Symposium Oral Presentations (SOP)

Determination of nitrogen content of nitrocellulose by chromatography

Monique van Hulst and Jamila Rahmouni

TNO Defense, Safety and Security, Lange Kleiweg 137, 2288 GJ Rijswijk, The Netherlands

#2016-SOP-02

Thermal and mechanical hazards of nitrocellulose and its mixture with nitroglycerine

S. Singh¹, Q. Kwok¹, R. Turcotte¹ and M. Paquet²

¹*Canadian Explosives Research Laboratory, Natural Resources Canada,*

1 Haanel Drive., Bells Corners Complex – Building 12, Ottawa, Ontario, K1A 1M1

²*General Dynamics OTS-Canada Valleyfield, Canada*

#2016-SOP-03

Correlation of DWP cellulose hot alkali solubility test results to characteristics in nitrocellulose product

Zachary Higginbotham, Cruz Redman, Mark Cook

BAE Systems, Radford Army Ammunition Plant, Radford, Virginia, USA.

#2016-SOP-04

Continuous analysis of mixed acids as a three-component fluid system

Přemysl Gromada, Jaroslav Štěpán, Oldřich Večerek

SYNTHESIA, a. s., Pardubice, Czech Republic

#2016-SOP-05

Determination of nitrocellulose properties by near infrared spectroscopy: nitrogen content, viscosity, solubility, total volatile content and residual water

Petra Loudová, Jaroslav Štěpán, Oldřich Večerek

SYNTHESIA, a. s., Pardubice, Czech Republic

#2016-SOP-06

Treatment of wastewaters from nitrocellulose production

Radim Stanek

Kralovehradecka provozni, a.s., Veolia Group, Czech Republic

#2016-SOP-08

Novel stabilisers for nitrocellulose-based propellants

Alain Dejeaifve, Lara Monseur, Nicole Fonder and Rowan Dobson

Eurengo – PB Clermont 176 Rue de Clermont, 4480 Engis, Belgium

#2016-SOP-09

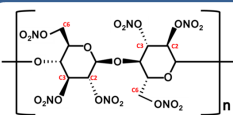
Study of photo-crosslinking of nitrocellulose stabilised with diphenylamine

M Moniruzzaman and N Mai

Cranfield University, Defence Academy of the UK,

Shrivenham, Swindon, SN6 8LA, United Kingdom

#2016-SOP-12



Nitrocellulose degrees of freedom - Chemico-physical effects on mechanical processing

Matt Parker, Nathalie Mai, Caroline O'Keeffe, Guillaume Kister, Mohamed Moniruzzaman, and Philip P Gill

*Centre for Defence Chemistry, Cranfield University,
Defence Academy of the United Kingdom, Shrivenham, SN6 8LA*

#2016-SOP-17

Investigation of ageing behaviour of plasticised nitrocellulose – accelerated ageing and real ageing

Dr. Manfred A. Bohn

Fraunhofer Institute for Chemical Technology (ICT), Postfach 1240, D-76318 Pfinztal, Germany

#2016-SOP-20

Nitrocellulose Processing in a Flammable Solvent: Designing a Safer Process

Paul Deacon

AWE, Aldermaston, Reading. RG7 4PR

#2016-SOP-22

Progress toward reliable Nitrocellulose Molecular Mass Distribution by Gel Permeation Chromatography at AWE

E Stubbs

AWE, Aldermaston, Reading. RG7 4PR

#2016-SOP-23

Oscillatory rheology of plasticised Nitrocellulose formulations

Daniel Lewis and Adam Halford

AWE, Aldermaston, Reading. RG7 4PR

#2016-SOP-24

Nitrocellulose: a cellulose raw material perspective

Derek Budgell

Tembec Specialty Cellulose

#2016-SOP-27

InFuse™ Nitrocellulose: A novel approach to gun propellant technology

Milca Fils-Aime¹, Douglas Messner¹, Gregory Startzell¹, Stephen Velarde¹, W. J. Worrell²

¹Orbital ATK, New River Energetics, RAAPt, Radford, VA, USA

²Upland Propellant Technologies, Draper, VA, USA

#2016-SOP-28

Long term mass loss studies of different propellants used in ageing analysis

Moritz Heil, Manfred A. Bohn

Fraunhofer ICT, Joseph-von-Fraunhofer-Str. 7, 76327 Pfinztal, Germany

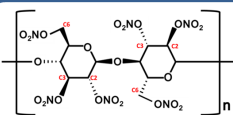
#2016-SOP-29

Morphology analysis measurement and correlation with fineness

Claude Guillaume

Manuco, Bergerac, France

#2016-SOP-31



CHARACTERIZATION SAFETY PROCESSABILITY PERFORMANCE

Bacterial Cellulose - Analysis and Nitration

Eamon Colclough, Rob Endsor, Javid Hamid, Simon Torry
QinetiQ, Fort Halstead, Sevenoaks, Kent TN14 7BP, UK.
 #2016-SOP-32

Qualification of Cotton Linters

Nigel Rutter
Defence Ordnance Safety Group ST1a1, Defence Equipment and Support
Joint UK Industry & Ministry of Defence Approach
 #2016-SOP-35

Methods for the determination of nitrogen content in Nitrocellulose

Beat Vogelsanger, Marc Müller, Beate Pausch, Michael Ramin
Nitrochemie Wimmis AG, Switzerland
 #2016-SOP-38

Development of Insensitive Munitions (IM) Thermoplastic elastomer (TPE) propellants for Large Calibre Gun Systems

Mark J Penny¹, Anne Marie Wilton²
¹*BAE Systems, Glascoed, Usk, Monmouthshire, NP15 1XL*
²*BAE Systems, Georgetown Reception Centre, Houston Road, Johnston, PA6 7GB*
 #2016-SOP-43

Ageing Protocol Development to Support the Qualification of Propellant Manufactured on Australia's Modernised Mulwala Facility

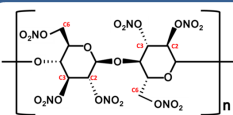
Andrew Hart, Joel Mortimer, Joel Huf, Chad Prior and Steve Odgers
Weapons and Combat Systems Division Defence Science and Technology Group
 #2016-SOP-44

NC fiber length distribution: Empirical modeling of mass weighted distribution obtained by fiber length analyzers

Mario Paquet
General Dynamics OTS-Canada Valleyfield, Canada
 #2016-SOP-50

Safety of storage and handling NG spent acid: Modelization of NG spent thermal stability for quantitative safety assessment

Mario Paquet
General Dynamics OTS-Canada Valleyfield, Canada
 #2016-SOP-52



Summary for Symposium Poster Presentations (SPP)

Quantitative safety assessment of handling and storage of NG spent acid and estimation of hazard rating of NC and other nitrate ester spent acids

Mario Paquet, Ian Levac and Louis-Étienne Boudreau Loiselle

General Dynamics OTS-Canada Valleyfield, Canada

#2016-SPP-13

Measurement of concentration of nitrocellulose in water

Claude Guillaume

Manuco, Bergerac, France

#2016-SPP-30

Homogeneity of a plasticised Nitrocellulose binder formulation

S Hazelwood and E Stubbs

AWE, Aldermaston, Reading. RG7 4PR

#2016-SPP-39

A classification model for propellant fire propagation

Frederick Paquet^{1,2}, Hoi Dick Ng¹, Mario Paquet², Francois Cottin²

¹ *Department of Mechanical and Industrial Engineering,
Concordia University, Montreal, Quebec, Canada*

² *General Dynamics OTS-Canada Valleyfield, Quebec, Canada*

#2016-SPP-42

A model for propellant fire radiant heat flux output

Frederick Paquet^{1,2}, Hoi Dick Ng¹, Mario Paquet², Dominic Groulx³, and Francois Cottin²

¹ *Department of Mechanical and Industrial Engineering,
Concordia University, Montreal, Quebec, Canada*

² *General Dynamics OTS-Canada Valleyfield, Canada*

³ *Department of Mechanical Engineering,
Dalhousie University, Halifax, Nova Scotia, Canada*

#2016-SPP-33

Implementation of Multilayered Propellant Extrusion in Concentric Cylinders

Simon Durand^{1,2}, Charles Dubois^{1,2}, Pierre G. Lafleur¹, Pierre-Yves Paradis², Daniel Lepage²

¹ *Ecole Polytechnique de Montreal, Canada*

² *General Dynamics OTS-Canada Valleyfield, Canada*

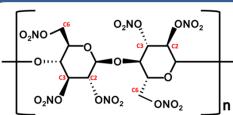
#2016-SPP-34

Development of a continuous celluloid twin screw extrusion process

Etienne Comtois

General Dynamics OTS-Canada Valleyfield, Canada

#2016-SPP-37



Relaxation Spectra of Plasticised Nitrocellulose

Jonathan Lavoie¹, Charles Dubois^{1*} and Catalin-Florin Petre²

¹ Chemical Engineering Department, École Polytechnique de Montréal
Montréal, H3C 3A7 (Canada) * E-mail: charles.dubois@polymtl.ca

² Defense Research & Development Canada Valcartier
Valcartier G1X 3J5 (Canada)

#2016-SPP-36

Canmet Canadian Explosives Research Laboratory:

Science in Support of Explosives Safety and Security

S. Maach, Manager Canmet CRL

Canadian Explosives Research Laboratory, Natural Resources Canada

1 Haanel Drive, Bells Corners Complex – Building 12, Ottawa, Ontario, K1A 1M1

#2016-SPP-46

The effect of moisture on the decomposition of nitrocellulose using real-time chemiluminescence measurements

Caroline O'Keeffe, Matt Parker, Nathalie Mai, Ian Wallace, and Philip P Gill

Centre for Defence Chemistry, Cranfield University,

Defence Academy of the United Kingdom, Shrivenham, SN6 8LA

#2016-SPP-19

Quantitative determination of NC fines, fragments and dust by a sedimentation method

Ian Levac and Mario Paquet

General Dynamics OTS-Canada Valleyfield, Canada

#2016-SPP-51

Preparation and standardization of Methyl Violet Paper

Ian Levac and Mario Paquet

General Dynamics OTS-Canada Valleyfield, Canada

#2016-SPP-49

Development of Insensitive Munitions (IM) Thermoplastic elastomer (TPE) propellants for Large Calibre Gun Systems

Mark J Penny¹, Anne Marie Wilton²

¹BAE Systems, Glascoed, Usk, Monmouthshire, NP15 1XL

²BAE Systems, Georgetown Reception Centre, Houston Road, Johnston, PA6 7GB

#2016-SPP-47