TECHNICKÁ UNIVERZITA V KOŠICIACH

**STROJNÍCKA FAKULTA**

# PREHĽAD PREUKÁZATEĽNÝCH CITÁCIÍ A OHLASOV NA VEDECKÉ A ODBORNÉ PRÁCE

RNDr. Mgr. Petr Adolf SKŘEHOT, Ph.D.

Košice 2019

## Ohlasy na monografie

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| AAA | Skřehot P., Rupová M. **Nanobezpečnost**. Praha : VÚBP, 2011. 240 s. | |
| ohlasy | Adamec J., Schullerová B. ... [et al.] Možné přístupy k hodnocení rizik nanočástic z pohledu znalce. ExFos 2018. 2018, 9-21. ISSN 978-80-214-5600-6. | [4] |
| | Berger F., Bernatíková Š. ... [et al.] Nebezpečnost nanomateriálů na pracovištích a možnosti prevence. Bezpečnost a ochrana zdraví při práci 2019. 2019, ISSN 978-80-248-2010-1. | [4] |
| | Hurbánková M., Hrašková D., Moricová Š. Profesionálna expozícia nanočasticiam. Pracovní Lékařství. 2014, č. 2-3, 78-84. ISSN 0032-6291. | [4] |
| | Hrašková D. Sledovanie zápalových a cytotoxických parametrov bronchoalveolárnej laváže po expozícií vybraným nanočasticiam. IV. Ročník konferencie doktorandov Trnava 2014. 2014, 163-171. ISSN 978-80-8082-773-1. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| AAA | Skřehot P. ... [et al.]. **Prevence nehod a havárií, 1. díl: Nebezpečné látky a materiály**. Praha : VÚBP, 2009. 341 s. | |
| ohlasy | Hon Z. Základy toxikologie pro obor vodního hospodářství. Vysoká škola evropských a regionálních studií České Budějovice. 2013, ISSN 978-80-87472-56-9. | [4] |
| | Lacina P., Mika OJ., Šebková K. Nebezpečné chemické látky a směsi. Masarykova univerzita. 2013, 108. ISSN 978-80-210-6475-1. | [4] |
| | Oravec M., Kováčová B., Vargová S., Glatz J. Využitie ekonomických nástrojov v oblasti podnikovej bezpečnosti. Manažment v teórii a praxi. 2012, č. 1-2, 33. ISSN 1336-7137. | [4] |
| | Oravec M., Kováčová B. Návrh bariérových modelov a výber ekonomických nástrojov pre ich aplikáciu. Bezpečnost a ochrana zdraví při práci 2012. 2012, 91-96. ISSN 978-80-248-2670. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| AAA | Skřehot P. ... [et al.] **Prevence nehod a havárií : 2 díl : mimořádné události a prevence nežádoucích následků.** Praha : VÚBP, 2009. 595 s. | |
| ohlasy | Becherová O. RISKS CONNECTED WITH RAILWAY TRANSPORT: SOCIOLOGICAL-PSYCHOLOGICAL POINT OF VIEW. Science & Philosophy - Journal of Epistemology, Science and Philosophy. 2016, č. 2, 117-125. ISSN 2282-7757. | [3] |
| | Pačaiová H. Požiadavky na integráciu manažérskych systémov na báze manažérstva rizík. Bezpečnost a ochrana zdraví při práci 2015. 2015, 77-80. ISSN 978-80-7385-162-0. | [4] |
| | Danihelka P. ... [et al.] Analýza a management rizik závažných havárií s nebezpečnými látkami v energetice. Vysoká škola báňská – Technická univerzita Ostrava. 2014, ISSN 978-80-248-3428-3. | [4] |
| | Sluka V. Chemická rizika – využití prevence závažných havárií pro BOZP. Bezpečnosti a hygiena práce. 2013, č. 10. ISSN 0006-0453. | [4] |
| | Píšala J., Havlová M. Možnosti nelegální výroby výbušnin a nebezpečí s ní související. Časopis výzkumu a aplikací v profesionální bezpečnosti. 2012, č. 3-4. ISSN 1803-3687. | [4] |
| | Oravec M. Manažérstvo priemyselných havárií. Technická univerzita v Košiciach. 2011, ISSN 978-80-553-0727-5. | [4] |
| | Klement C. ... [et al.] Mimoriadne udalosti vo verejnom zdravotníctve. Pro. 2011, ISSN 978-80-89057-29-0. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| AAA | Marek J., Skrehot P. **Základy aplikované ergonomie**. Praha: VÚBP, 2009; 118. | |
| ohlasy | Koutný P., Radkovský J. Intenzita osvětlení jako možný zdroj pracovního úrazu, nehody nebo jako rizikový faktor pracovního prostředí. Bezpečnost a ochrana zdraví při práci 2016. 2016, 37-40. ISSN 978-80-7385-175-0. | [4] |
| | Koutný P., Hajduková Z. Aplikace ergonomie jako multidisciplinárního oboru do praxe. Bezpečnost a ochrana zdraví 2015. 2015, 49-52. ISSN 978-80-7385-162-0. | [4] |
| | Dulina L., Bartanusova M. Ergonomics in Practise and its Influence on Employees Performance. Communications. 2014, 206-211. ISSN 1335-4205. | [4] |
| | Sevcik J., Malus M., Svoboda P. Large-Scale Industrial Company Alarm Receiving Centre Modernization Design. WSEAS Transactions on Communications. 2014, 587-595. ISSN 1109-2742. | [4] |
| | Šourek D., Hlavsová P. Možnosti využití simulačních nástrojů pro posouzení ergonomie při bezpečnostních kontrolách. Air Transport Security 2014, 3. mezinárodní vědecká konference. 2014, 119-124. ISSN 978-80-86841-51-9. | [4] |
| | Koutný P. Porovnání principů zlepšování pracovních podmínek se zaměřením na Hyundai Motor Manufacturing Czech. Bezpečnost a ochrana zdraví při práci 2014. 2014, 57-59. ISSN 978-80-7385-145-3. | [4] |
| | Šustová Z., Hodačová L., Kapitán M. The Prevalence of Musculoskeletal Disorders Among Dentists in the Czech Republic. Acta Medica. 2013, č. 4, 150-156. ISSN 1211-4286. | [4] |
| | Koutný P., Bartlová I. Ergonomics as instrument for prevention against work injury or occupational diseases. Transactions of the VSB - Technical university of Ostrava. 2018, č. 2, 55 - 60. ISSN 1805-3238. | [4] |
| | Sekulová K., Šimon M. Využití legislativy jako součásti ergonomického nástroje Tecnomatix Jack. Časopis výzkumu a aplikací v profesionální bezpečnosti. 2012, č. 3-4. ISSN 1803-3687. | [4] |
| | Doležal R. Design of operational center in central-european reality. 1st Virtual International Conference on Advanced Research in Scientific Areas 2012. 2012, 1781-1784. ISSN 978-80-554-0606-0. | [3] |
| | Seňová A., Čulková K. Risk Management in Area of Security and Protection of Health During the Work. New Technologies - Trends, Innovations and Research. 2012, 347-376. ISSN 978-953-51-0480-3. | [3] |

| | | |
|---|---|---|
| | Šišková V., Šimon M. Using of Deming cycle to evaluate climatic conditions at workplace. Latest Trends in Environmental and Manufacturing Engineering. 2012, 84-89. ISSN 978-1-61804-135-7. | [3] |
| | Watt A., Tůmová Š. Uplatnění poznatků z ergonomie při práci s počítačem. Ikaros - elektronický časopis o informační společnosti. 2011, č. 9. ISSN 1212-5075. | [4] |
| | Sekulová K., Šimon M. Risk of Musculoskeletal Disorders and Occupational Diseases. 22nd International DAAAM Symposium. 2011, č. 1, 777. ISSN 1726-9679. | [3] |
| | Malý S., Král M., Hanáková E. ABC Ergonomie. Professional Publishing. 2010, ISSN 978-80-7431-027-0. | [4] |
| | Hnilica R., Dado M. Kumulatívne posobenie faktorov pracovného prostredia na zvárača. Aktuálne otázky BOZP 2009. 2009, 116-121. ISSN 978-80-553-0220-1. | [4] |


| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| AAA | Michalík D., Skřehot P. **Kancelářská pracoviště s důrazem na typ open space**. Praha: VÚBP, 2010. 163. | |
| ohlasy | Senčík J. Zaměstnanec a právo na kvalitní kancelářské prostředí. Bezpečnost a hygiena práce. 2015, č. 7-8, 12-18. ISSN 0006-0453. | [4] |
| | Kobylková B., Straková J. Zdraví pracovníků v kancelářích typu open space. Pracovní Lékařství. 2013, č. 1-2, 14-18. ISSN 0032-6291. | [4] |
| | Michalík D. Co je potřeba vědět o OPEN SPACE? Bezpečnosti a hygiena práce. 2013, č. 10. ISSN 0006-0453. | [4] |

## Ohlasy na články v časopisech

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADC | Civiš M., Ferus M., Knížek A., Kubelík P., Kamas M., Španěl P., Dryahina K., Shestivska V. Juha L., Skřehot P.A., Laitl V., Civiš S. **Spectroscopic investigations of high-energy-density plasma transformations in a simulated early reducing atmosphere containing methane, nitrogen and water**. Physical Chemistry Chemical Physics. 2016, ISSN 1463-9076. | |
| ohlasy | Ferus M., Laitl V. ... [et al.] HNCO-based synthesis of formamide in planetary atmospheres. ASTRONOMY & ASTROPHYSICS. 2018, č. 8. ISSN 1432-0746. | [1] |
| | Civis S., Knizek A., Civis P. CHEMICAL ABIOGENESIS: ARTISTIC CONCEPT TURNED INTO SCIENTIFIC REALITY. Chemické Listy. 2019, č. 4, 223-232. ISSN 0009-2770. | [2] |
| | Civis S., Knizek A., Ivanek O. ... [et al.] The origin of methane and biomolecules from a CO2 cycle on terrestrial planets . NATURE ASTRONOMY. 2017, č. 10, 721-726. ISSN 2397-3366. | [1] |
| | Ferus M., Kubelik P., Knizek A. ... [et al.] High Energy Radical Chemistry Formation of HCN- rich Atmospheres on early Earth. SCIENTIFIC REPORTS. 2017, č. 7, 6275. ISSN 2045-2322. | [1] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADC | Knížek A., Zukalová M., Kavan L., Zukal A., Kubelík P., Rojík P., Skřehot P.A., Ferus M., Civiš S. **Spontaneous oxygen isotope exchange between carbon dioxide and natural clays: Refined rate constants referenced to TiO2 (anatase/rutile)**. Applied Clay Science. 2016, ISSN 0169-1317. | |
| ohlasy | Civis S., Knizek A., Rimmer PB. Formation of Methane and (Per)Chlorates on Mars. ACS EARTH AND SPACE CHEMISTRY. 2019, č. 3, 221-232. ISSN 2472-3452. | [1] |
| | Civis S., Knizek A., Civis P. CHEMICAL ABIOGENESIS: ARTISTIC CONCEPT TURNED INTO SCIENTIFIC REALITY. Chemické Listy. 2019, č. 4, 223-232. ISSN 0009-2770. | [2] |
| | Knizek A., Dryahina K., Spanel P. ... [et al.] Comparative SIFT-MS, GC-MS and FTIR analysis of methane fuel produced in biogas stations and in artificial photosynthesis over acidic anatase TiO2 and montmorillonite. Journal of Molecular Spectroscopy. 2018, 152-160. ISSN 0022-2852. | [1] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADC | Skřehot P.A., Marek J., Houser, F. **Ergonomic aspects in control rooms**. Theoretical Issues in Ergonomics Science. 2016, ISSN 1463-922X. | |
| ohlasy | Sukapto P., Djojosubroto H., Permana H. Penerapan Metode Job Safety Analysis and Risk Score untuk Meningkatkan Keselamatan dan Kesehatan Kerja pada Departemen Printing, Sewing dan Assembly PT. PAI, Bandung (Suatu Pendekatan Participatory Ergonomic). Jurnal Kesehatan. 2018, 403-411. ISSN 2548-5695. | [3] |
| | Long J., Ockendon R., McDonald F. Visual Ergonomics in Control Rooms – An Example of Creativity in Practice. EA 2018: Proceedings of the 20th Congress of the International Ergonomics Association . 2018, 125-132. ISSN 978-3-319-96059-3. | [1] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADC | Civiš S., Civiš M., Sovová K., Dryahina K., Kubišta J., Skřehot P.A., Španěl P., Kyncl, M. **Selected ion flow tube mass spectrometry analyses of laser decomposition products of a range of explosives and ballistic propellants.** Analyst. 2016, ISSN 0003-2654. | |
| ohlasy | Zhang W. Bao LR. ... [et al.] Identification and formation mechanism of the transient ion fragments produced in laser-induced dissociation of 1, 1-diamino-2, 2-dinitroethytene. Laser and Particle Beams. 2018, č. 3, 308-312. ISSN 0263-0346. | [1] |
| | Zhang W., Tang Y. ... [et al.] Recent Developments in Spectroscopic Techniques for the Detection of Explosives. Materials. 2018, 1364. ISSN 1996-1944. | |
| | Ong TH., Mendum T. ... [et al.] Use of Mass Spectrometric Vapor Analysis To Improve Canine Explosive Detection Efficiency. ANALYTICAL CHEMISTRY. 2017, 6482-6490. ISSN 0003-2700. | [1] |
| | Zhang P., Sun LX. ... [et al.] A method derived from Genetic Algorithm, Principal Component Analysis and Artificial Neural Networks to enhance classification capability of Laser- Induced Breakdown Spectroscopy. OPTICAL SPECTROSCOPY AND IMAGING. 2017, 1046107. ISSN 0277-786X. | [1] |
| | Carter S., Fisher A. ... [et al.] Atomic spectrometry update: review of advances in the analysis of metals, chemicals and functional materials. JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY. 2016, č. 11, 2114-2164. ISSN 0267-9477. | [1] |

| | | |
|---|---|---|
| | Meng, X., Yang, Y., Xiao, Z. Preparation of an Electrochemical Sensor Based on Surface Molecularly Imprinted Polymers Modified Electrode and its Application in Detection of Nitrocellulose. Propellants, Explosives, Pyrotechnics. 2019, ISSN 07213115. | [1] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADD | Skřehot P.A., Marek J., Kožmín P., Skřehotová M. **Nová právní úprava pro nakládání s nebezpečnými chemickými látkami a chemickými směsmi**. Chemické listy. 2016, č. 7, 517-523. ISSN 0009-2770. | |
| ohlasy | Holzhauser P., Matuška R. Použití chemických látek při výuce a v rámci volnočasových aktivit žáků mladších 15 let. Chemické Listy. 2019, č. 4, 233-239. ISSN 0009-2770. | [2] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADE | Skřehot P. **Vyšla nová kniha Prevence nehod a havárií**. Časopis výzkumu a aplikací v profesionální bezpečnosti, 2009, roč. 2, č. 4. | |
| ohlasy | Turza J., Eliáš J. ... [et al.] Modelling of an Explosion of an Improvised Explosive Device a Vehicle. American Journal of Mechanical Engineering. 2014, č. 7, 209-215. ISSN 2328-4102. | [3] |
| | Turza J., Eliáš J., Kopiláková B. Problémy modelovania explózie nástražného systému pod vozidlom. Riadenie tekutinových systémov 2014. 2014, 86. ISSN 978-80-970897-8-8. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADE | Skřehot P. **Spolehlivost lidského činitele**. BOZPinfo. 2009. | |
| ohlasy | Strelcová S. Ľudský činiteľ v technologických procesoch. Ekonomika a management. 2012, č. 2, 1-4. ISSN 1802-8470. | [4] |
| | Strelcová S. Hodnotenie spoľahlivosti ľudského faktora v technologických procesoch. Periodica Academica. 2012, č. 1, 122-126. ISSN 1802-2626. | [4] |
| | Mikloš V., Virčíková E. Klasifikácia ludskej chyby v manažérstve ludských zlyhaní. Aktuálne otázky BOZP 2006. 2006, 101-108. ISSN 80-8073-649-9. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADE | Skřehot P. **Spolehlivost člověka v pracovním systému**. Journal of Safety Research and Application, 2008, vol. 1, no. 1. | |
| ohlasy | Hrubá L., Švejdová G. Vliv pracovních podmínek na výkon zaměstnance. LITTERA SCRIPTA. 2011, č. 1, 31-38. ISSN 1802-503X. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADE | Skřehot P. **Verification of SPREAD model of life : endangering events effects and impacts – SPREAD project**. Journal of Safety Research and Application, 2008, vol. 1, no. 3. | |
| ohlasy | Civiš M. The resuspension chamber as a tool for complex characterization of the quartz test aerosol. Časopis výzkumu a aplikací v profesionální bezpečnosti. 2010, č. 2. ISSN 1803-3687. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADE | Skřehot P. Malčíková K. **Nové metody a přístupy určené pro vyšetřování kořenových příčin selhání lidského činitele v procesním průmyslu**. BOZPinfo. 2008. | |
| ohlasy | Trpiš J. Pravděpodobnostní hodnocení spolehlivosti lidského činitele v procesním průmyslu. Bezpečnost a ochrana zdraví při práci 2010. 2010, 281-287. ISSN 978-80-248-2207-5. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADE | Skřehot P. **Chyby lidského činitele a identifikace jejich příčin**. Journal of Safety Research and Application, 2009, vol. 2, no. 1. | |
| ohlasy | Turekova I., Turňová Z. Assessment of Human Factor in Production Engineering. Occupational Safety and Hygiene : Proceedings of the 9th International Symposium on Occupational Safety and Hygiene, SHO 2013. 2013, 567-570. ISSN 978-1-138-00047-6. | [3] |

## Ohlasy na články ve sbornících

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| ADM | Rupová M., Skřehot P. A. **Aktuální otázky bezpečnosti práce s nanomateriály (Actual question about safety at work with nanomaterials)**. In: Nanocon 2009. 2009, 77-78. ISBN 978-80-87294-12-3. | |
| ohlasy | Drastichová V., Bartlová I., Jankovská Z. Testing the Effect of Fullerene and its Derivatives on the Environment. Safety Engineering Series. 2013, č. 1, 1-8. ISSN 1805-3238. | [4] |
| | Sovová T., Kočí V. Ekotoxikologie Nanomateriálů. Chemické Listy. 2012, 82-87. ISSN 0009-2770. | [2] |

## Ohlasy na ostatní publikace

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| GII | Rupová M., Skřehot P. A. **Bezpečnost a ochrana zdraví při práci s nanomateriály. Příručka pro zaměstnavatele**. Praha : VÚBP, 2011. | |
| ohlasy | Filipová Z., Kukutschová J., Mašláň M. Rizika nanomateriálů. Univerzita Palackého v Olomouci. 2012, ISSN 978-80-244-3201-4. | [4] |

| | | |
|---|---|---|
| GII | Skřehot P. **Naučte se číst ze synoptické mapy**. APO, Brno, 2005, 24 s. | |
| ohlasy | Plánka L. Mezo(topo)klimatické mapy a mapování. Acta Montanistica Slovaca. 2007, č. 3, 498-505. ISSN 1335-1788. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| GII | Skřehot P. **Úvod do studia meteorologie**. M.O.R., 2004. | |
| ohlasy | Klasna M., Láznička P. Příklady úloh měření vlhkosti plynů (část 3). Automa. 2012, č. 12, 38-40. ISSN 1210-9592. | [4] |

| Kategórie publikačnej činnosti | Bibliografický odkaz | Pozn. |
|---|---|---|
| GII | Skřehot P. **Modelování rozptylu toxických látek v atmosféře při průmyslových haváriích**. Praha, 2008. Diplomová práce. PřF UK. | |
| ohlasy | Adamec J., Schullerová B. ... [et al.] Modelování úniku amoniaku a chlóru v hustě obydlených městských oblastech. Advances in Fire and Safety Engineering 2017. 2017, 36-55. ISSN 978-80-8096-245-6. | [4] |

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**Documents**

Sovová, T., Kočí, V.

**Ecotoxicology of nanomaterials [Ekotoxikologie nanomateriálů]**
(2012) *Chemicke Listy*, 106 (2), pp. 82-87. Cited 8 times.

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Název článku: **Nová právní úprava pro nakládání s nebezpečnými chemickými látkami a chemickými směsmi**

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**Record 1 of 2**

**Title:** The Use of Chemical Substances in Teaching and Free Time Activities of Pupils below 15 Years

**Author(s):** Holzhauser, P (Holzhauser, Petr); Matuska, R (Matuska, Radek)

**Source:** CHEMICKE LISTY **Volume:** 113 **Issue:** 4 **Pages:** 233-239 **Published:** 2019

**Abstract:** Demonstration experiments, as well as those performed by pupils, represent an integral part of our school's education process. The handling of chemicals by pupils up to 15 years is practically uncovered by legislation. This contribution brings an overview of the valid general regulations for handling chemicals. It also presents the standpoint of the Czech Ministry of Education to the Chemistry Olympiad of elementary school pupils and regulations concerning chemical toys and sets for chemical experiments which are not well known among the chemical community. The core of the contribution is the list of chemical substances which can be handled by pupils of the age between 8 and 15 years. The new part of the regulation defining the principles of safe work in a school laboratory is briefly introduced. The aim is to inform the chemical community, mainly the elementary and secondary school teachers that the Czech and European regulations actively and positively support that the children over 8 years will play/work with some chemical substances.

**Accession Number:** WOS:000464613600007

**ISSN:** 0009-2770

**eISSN:** 1213-7103

**Record 2 of 2**

**Title:** Requirements to Ensure The Safety and Health of Pupils in The Use of Hazardous Chemicals during The Practical Teaching Chemistry

**Author(s):** Skrehot, PA (Skrehot, Petr A.); Marek, J (Marek, Jakub); Skrehotova, M (Skrehotova, Marcela); Houser, F (Houser, Frantisek); Pil'a, J (Pil'a, Jan)

**Source:** CHEMICKE LISTY **Volume:** 110 **Issue:** 12 **Pages:** 947-952 **Published:** DEC 2016

**Abstract:** In 2015, there were a number of legislative changes newly modifying certain requirements to ensure the safety and health of pupils when handling chemical substances and mixtures in the practical teaching chemistry in schools. These modifications included not only specifying the categories of substances which young pupils can work with in the preparation for their profession, but also defining the measures guaranteeing adequate protection of their health. However, the complexity of the issue, which closely coincides with labor legislation, may cause considerable problems in practice due to its intricacy. In order to help the headmasters and teachers of chemistry to be better knowledgeable in their duties, this article focuses on selected problems which need priority consideration. The importance of issues relating to occupational safety for the handling and storage of chemicals in schools is adequately demonstrated through evidence and photographs obtained during authors' expert work.

**Accession Number:** WOS:000390899900016

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## Documents

Skřehot, P.A.[a b], Marek, J.[a c], Skřehotová, M.[b], Houser, F.[a], Piťa, J.[d]

**Requirements to ensure the safety and health of pupils in the use of hazardous chemicals during the practical teaching chemistry [Požadavky na zajištění bezpečnosti a ochrany zdraví žáků při používání nebezpečných chemických látek během praktické výuky chemie]**

(2016) *Chemicke Listy*, 110 (12), pp. 947-952.

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[c] Úřad městské části Praha 5, Náměstí 14. Října 4, Praha 5, 150 00, Czech Republic
[d] Technická univerzita v Košiciach, Rampová 7, Košice, 041 21, Czech Republic

**Publisher:** Czech Society of Chemical Engineering

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**CODEN:** CHLSA
**Language of Original Document:** Czech
**Abbreviated Source Title:** Chem. Listy
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**Document Type:** Article
**Publication Stage:** Final
**Source:** Scopus

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Název článku: **Praktické aspekty bezpečnosti a ochrany zdraví při výuce chemie ve školách**

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**Page 1 (Records 1 -- 1)**

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**Record 1 of 1**

**Title:** Requirements to Ensure The Safety and Health of Pupils in The Use of Hazardous Chemicals during The Practical Teaching Chemistry

**Author(s):** Skrehot, PA (Skrehot, Petr A.); Marek, J (Marek, Jakub); Skrehotova, M (Skrehotova, Marcela); Houser, F (Houser, Frantisek); Pil'a, J (Pil'a, Jan)

**Source:** CHEMICKE LISTY **Volume:** 110 **Issue:** 12 **Pages:** 947-952 **Published:** DEC 2016

**Abstract:** In 2015, there were a number of legislative changes newly modifying certain requirements to ensure the safety and health of pupils when handling chemical substances and mixtures in the practical teaching chemistry in schools. These modifications included not only specifying the categories of substances which young pupils can work with in the preparation for their profession, but also defining the measures guaranteeing adequate protection of their health. However, the complexity of the issue, which closely coincides with labor legislation, may cause considerable problems in practice due to its intricacy. In order to help the headmasters and teachers of chemistry to be better knowledgeable in their duties, this article focuses on selected problems which need priority consideration. The importance of issues relating to occupational safety for the handling and storage of chemicals in schools is adequately demonstrated through evidence and photographs obtained during authors' expert work.

**Accession Number:** WOS:000390899900016

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**Documents**

Skřehot, P.A.[a b], Marek, J.[a c], Skřehotová, M.[b], Houser, F.[a], Piľa, J.[d]

**Requirements to ensure the safety and health of pupils in the use of hazardous chemicals during the practical teaching chemistry [Požadavky na zajištění bezpečnosti a ochrany zdraví žáků při používání nebezpečných chemických látek během praktické výuky chemie]**

(2016) *Chemicke Listy*, 110 (12), pp. 947-952.

[a] Znalecký ústav bezpečnosti a ochrany zdraví, z.ú, Divišova 235, Pardubice, 530 02, Czech Republic
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[c] Úřad městské části Praha 5, Náměstí 14. Října 4, Praha 5, 150 00, Czech Republic
[d] Technická univerzita v Košiciach, Rampová 7, Košice, 041 21, Czech Republic

**Publisher:** Czech Society of Chemical Engineering

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**CODEN:** CHLSA
**Language of Original Document:** Czech
**Abbreviated Source Title:** Chem. Listy
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**Document Type:** Article
**Publication Stage:** Final
**Source:** Scopus

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Název článku: **Selected ion flow tube mass spectrometry analyses of laser decomposition products of a range of explosives and ballistic propellants**

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**Record 1 of 5**

**Title:** Identification and formation mechanism of the transient ion fragments produced in laser-induced dissociation of 1, 1-diamino-2, 2-dinitroethytene

**Author(s):** Zhang, W (Zhang, Wei); Bao, LR (Bao, Lirong); Jiang, KX (Jiang, Kexin); Shi, AR (Shi, Anran); Shen, RQ (Shen, Ruiqi); Ye, YH (Ye, Yinghua)

**Source:** LASER AND PARTICLE BEAMS **Volume:** 36 **Issue:** 3 **Pages:** 308-312 **DOI:** 10.1017/S0263034618000290 **Published:** SEP 2018

**Abstract:** Detailed knowledge of dissociation behavior and dissociation products is necessary to understand the stability, sensitivity, and the reactive mechanism of explosives under laser initiation. A time-of-flight mass spectrometer was utilized to detect the transient products of 1,1-diamino-2,2-dinitroethylene (FOX-7) produced under 532 nm pulse laser ablation, the possible attribution of intermediate ion fragments were confirmed. The laser fluence threshold for detectable fragments is about 3.6 J/cm(2). The peak intensities of main ions (CN, CNO/C2H4N, NO2, C2N2O, HCN, C2NH2, etc.) increase with the increasing of laser fluence, and reach the maximum at 11.5 J/cm(2). Moreover, time-depend changes of ion intensity indicate that the type and degree of reactions are different in different periods. According to the molecular structure of FOX-7 and the intermediate ions, the laser-induced dissociation mechanisms were proposed to illustrate the cause of the fragments which might throw some light on the laser initiation of FOX-7.

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**ISSN:** 0263-0346

**eISSN:** 1469-803X

**Record 2 of 5**

**Title:** Recent Developments in Spectroscopic Techniques for the Detection of Explosives

**Author(s):** Zhang, W (Zhang, Wei); Tang, Y (Tang, Yue); Shi, AR (Shi, Anran); Bao, LR (Bao, Lirong); Shen, Y (Shen, Yun); Shen, RQ (Shen, Ruiqi); Ye, YH (Ye, Yinghua)

**Source:** MATERIALS **Volume:** 11 **Issue:** 8 **Article Number:** 1364 **DOI:** 10.3390/ma11081364 **Published:** AUG 2018

**Abstract:** Trace detection of explosives has been an ongoing challenge for decades and has become one of several critical problems in defense science; public safety; and global counter-terrorism. As a result, there is a growing interest in employing a wide variety of approaches to detect trace explosive residues. Spectroscopy-based techniques play an irreplaceable role for the detection of energetic substances due to the advantages of rapid, automatic, and non-contact. The present work provides a comprehensive review of the advances made over the past few years in the fields of the applications of terahertz (THz) spectroscopy; laser-induced breakdown spectroscopy (LIBS), Raman spectroscopy; and ion mobility spectrometry (IMS) for trace explosives detection. Furthermore, the advantages and limitations of various spectroscopy-based detection techniques are summarized. Finally, the future development for the detection of explosives is discussed.

**Accession Number:** WOS:000444112800101

**PubMed ID:** 30082670

**ISSN:** 1996-1944

**Record 3 of 5**

**Title:** Use of Mass Spectrometric Vapor Analysis To Improve Canine Explosive Detection Efficiency

**Author(s):** Ong, TH (Ong, Ta-Hsuan); Mendum, T (Mendum, Ted); Geurtsen, G (Geurtsen, Geoff); Kelley, J (Kelley, Jude); Ostrinskaya, A (Ostrinskaya, Alla); Kunz, R (Kunz, Roderick)

**Source:** ANALYTICAL CHEMISTRY **Volume:** 89 **Issue:** 12 **Pages:** 6482-6490 **DOI:** 10.1021/acs.analchem.7b00451 **Published:** JUN 20 2017

**Abstract:** Canines remain the gold standard for explosives detection in many situations, and there is an ongoing desire for them to perform at the highest level. This goal requires canine training to be approached similarly to scientific sensor design. Developing a canine training regimen is made challenging by a lack of understanding of the canine's odor environment, which is dynamic and typically contains multiple odorants. Existing methodology assumes that the handler's intention is an adequate surrogate for actual knowledge of the odors cuing the canine, but canines are easily exposed to unintentional explosive odors through training material cross-contamination. A sensitive, real-time (similar to 1 s) vapor analysis mass spectrometer was developed to provide tools, techniques, and knowledge to better understand, train, and utilize canines. The instrument has a detection library of nine explosives and explosive-related materials consisting of 2,4-dinitrotoluene (2,4-DNT), 2,6-dinitrotoluene (2,6-DNT), 2,4,6-trinitrotoluene (TNT), nitroglycerin (NG), 1,3,5-trinitroperhydro-1,3,5-triazine (RDX), pentaerythritol tetranitrate (PETN), triacetone triperoxide (TATP), hexamethylene triperoxide diamine (HMTD), and cyclohexanone, with detection limits in the parts-per-trillion to parts-per-quadrillion range by volume. The instrument can illustrate aspects of vapor plume dynamics, such as detecting plume filaments at a distance. The instrument was deployed to support canine training in the field, detecting cross-contamination among training materials, and developing an evaluation method based on the odor environment. Support for training material production and handling was provided by studying the dynamic headspace of a nonexplosive HMTD training aid that is in development. These results supported existing canine training and identified certain areas that may be improved.

**Accession Number:** WOS:000404087600030

**PubMed ID:** 28598144

**ISSN:** 0003-2700

**eISSN:** 1520-6882

**Record 4 of 5**

**Title:** A method derived from Genetic Algorithm, Principal Component Analysis and Artificial Neural Networks to enhance classification capability of Laser-Induced Breakdown Spectroscopy

**Author(s):** Zhang, P (Zhang, P.); Sun, LX (Sun, L. X.); Kong, HY (Kong, H. Y.); Yu, HB (Yu, H. B.); Guo, MT (Guo, M. T.); Zeng, P (Zeng, P.)

**Edited by:** Yu J; Wang Z; Hang W; Zhao B; Hou X; Xie M; Shimura T

**Source:** AOPC 2017: OPTICAL SPECTROSCOPY AND IMAGING **Book Series:** Proceedings of SPIE **Volume:** 10461 **Article Number:** UNSP 1046107 **DOI:** 10.1117/12.2281493 **Published:** 2017

**Abstract:** Selection of characteristic lines is a critical work for both qualitative and quantitative analysis of laser-induced breakdown spectroscopy; it usually needs a lot of time and effort. A novel method combining genetic algorithm, principal component analysis and artificial neural networks (GA-PCA-ANN) is proposed to automatically extract the characteristic spectral segments from the original spectra, with ample feature information and less interference. On the basis of this method, three selection manners: selecting the whole spectral range, optimizing a fixed-length segment and optimizing several non-fixed-length sub-segments were analyzed; and their classification results of steel samples were compared. It is proved that selecting a fixed-length segment with an appropriate segment length achieves better results than selecting the whole spectral range; and selecting several non-fixed-length sub-segments obtains the best result with smallest amount of data. The proposed GA-PCA-ANN method can reduce the workload of analysis, the usage of bandwidth and cost of spectrometers. As a result, it can enhance the classification capability of laser-induced breakdown spectroscopy.

**Accession Number:** WOS:000425516200006

**Conference Title:** Annual Conference of the Chinese-Society-for-Optical-Engineering (CSOE) on Applied Optics and Photonics China (AOPC) - Optical Spectroscopy and Imaging

**Conference Date:** JUN 04-06, 2017

**Conference Location:** Beijing, PEOPLES R CHINA

**Conference Sponsors:** SPIE, Chinese Soc Opt Engn, Chinese Soc Astronaut, Photoelectron Technol Comm, CHIA, Acad & Res, Dept Cooperat & Coordinat Ind, Sci & Technol Low Light Level Night Vis Lab, Sci & Technol Electro Opt Informat Secur Control Lab, Opt Soc Korea, Opt & Photon Soc Singapore, European Opt Soc, Opt Soc Japan

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**ISSN:** 0277-786X

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**ISBN:** 978-1-5106-1404-8; 978-1-5106-1403-1

**Record 5 of 5**

**Title:** Atomic spectrometry update: review of advances in the analysis of metals, chemicals and functional materials

**Author(s):** Carter, S (Carter, Simon); Fisher, A (Fisher, Andy); Garcia, R (Garcia, Raquel); Gibson, B (Gibson, Bridget); Marshall, J (Marshall, John); Whiteside, I (Whiteside, Ian)

**Source:** JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY **Volume:** 31 **Issue:** 11 **Pages:** 2114-2164 **DOI:** 10.1039/c6ja90044e **Published:** 2016

**Abstract:** This ASU review focuses on developments in applications of atomic spectrometry to the characterisation of metals, chemicals and functional materials. While each of these application categories is very distinct in terms of the analytical challenges posed, there are a number of common themes than can be identified from an examination of the relevant literature appearing over the review period. The traditional atomic spectrometry techniques (e.g. AAS, OES, XRF, ICP-MS) are relatively mature, but reports continue to appear that seek to address perceived limitations in sensitivity in certain applications, but increasingly more frequently in relation to sample handling and preparation/extraction methodologies, validation and creation of SRMs and methods. However, it is equally clear that because of that very maturity such techniques are more often cited as analytical reference methods to support the development of other approaches (e.g. GD-OES, GD-MS, PIXE, PIGE, RBS, SEM-EDS, SIMS, TXRF, micro-and macro-XRF, XAS, XPS) that provide either direct sampling or depth and lateral elemental profiling capabilities. Consequently, a variety of techniques may now be routinely applied within an individual study to characterise samples to the extent it is hard to comment critically on the particular analytical novelty that lies at the heart of the work. It is fair to say that in some cases, the significance of the research now involves revealing the features of the sample (including examining surface modifications, coatings, thin films and multilayers, or even the characteristics of a device, functional component, or object, or complex mixture) rather than in the development of the analytical approach itself. That said, certain trends in technique development still expand the range of applications that can be addressed. For example, interest in LIBS continues to command attention and is heavily cited in most application sections of this review. The technique offers certain unique advantage for elemental analysis in rapid direct sampling, portability and operating in remote and harsh environments (including industrial production) where low level detection is not essential. Clearly sensitivity remains the Achilles' heel for LIBS but developments in measurement technique such as pulse delay are resulting in better optimised procedures. The development in laser solid sampling technology is providing benefits applicable to other techniques such as ICP-MS and newer variants such as laser ionisation MS. Indeed, lasers, flames, plasmas and other electrical discharges have been used regularly in the fabrication of samples. The atomic spectrometry techniques with which they have been associated are now employed to study such production processes in situ. The development of nanomaterials has given rise to new approaches to particle size distribution and single particle characterisation where the atomic spectrometric determination produces a size rather than a concentration. There is evidence too in the review of research work going on to understand the environmental consequences of the widespread use of new technologies using data analysis approaches to examine source, provenance or impact. Consequently, while the fundamental analytical questions: "What?" and "How much?" continue to be relevant to researchers increasingly these must now be qualified in many situations by providing answers to enquiries such as "Where?" and "How big (or small)?".

**Accession Number:** WOS:000387450700002

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## Documents

1) Meng, X., Yang, Y., Xiao, Z.

**Preparation of an Electrochemical Sensor Based on Surface Molecularly Imprinted Polymers Modified Electrode and its Application in Detection of Nitrocellulose**
(2019) *Propellants, Explosives, Pyrotechnics*, .

**DOI:** 10.1002/prep.201900018

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**Publisher:** Wiley-VCH Verlag

**ISSN:** 07213115
**CODEN:** PEPYD
**Language of Original Document:** English
**Abbreviated Source Title:** Propellants Explos Pyrotech
2-s2.0-85065156225
**Document Type:** Article
**Publication Stage:** Article in Press
**Source:** Scopus

2) Zhang, W., Bao, L., Jiang, K., Shi, A., Shen, R., Ye, Y.

**Identification and formation mechanism of the transient ion fragments produced in laser-induced dissociation of 1, 1-diamino-2, 2-dinitroethylene**
(2018) *Laser and Particle Beams*, 36 (3), pp. 308-312.

**DOI:** 10.1017/S0263034618000290

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**Publisher:** Cambridge University Press

**ISSN:** 02630346
**CODEN:** LPBED
**Language of Original Document:** English
**Abbreviated Source Title:** Laser Part Beams
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**Document Type:** Article
**Publication Stage:** Final
**Source:** Scopus

3) Zhang, W., Tang, Y., Shi, A., Bao, L., Shen, Y., Shen, R., Ye, Y.

**Recent developments in spectroscopic techniques for the detection of explosives**
(2018) *Materials*, 11 (8), art. no. 1364, . Cited 2 times.

**DOI:** 10.3390/ma11081364

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**Abbreviated Source Title:** Mater.
2-s2.0-85051105603
**Document Type:** Review
**Publication Stage:** Final
**Source:** Scopus
**Access Type:** Open Access

4) Ong, T.-H., Mendum, T., Geurtsen, G., Kelley, J., Ostrinskaya, A., Kunz, R.

**Use of Mass Spectrometric Vapor Analysis to Improve Canine Explosive Detection Efficiency**
(2017) *Analytical Chemistry*, 89 (12), pp. 6482-6490. Cited 11 times.

**DOI:** 10.1021/acs.analchem.7b00451

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**Publisher:** American Chemical Society

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**PubMed ID:** 28598144
**Language of Original Document:** English
**Abbreviated Source Title:** Anal. Chem.
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**Document Type:** Article
**Publication Stage:** Final
**Source:** Scopus

5) Zhang, P.[a b c], Sun, L.X.[a b], Kong, H.Y.[a b], Yu, H.B.[a c], Guo, M.T.[a c], Zeng, P.[a c]

**A method derived from genetic algorithm, principal component analysis and artificial neural networks to enhance classification capability of laser-induced breakdown spectroscopy**
(2017) *Proceedings of SPIE - The International Society for Optical Engineering*, 10461, art. no. 1046107, . Cited 1 time.

**DOI:** 10.1117/12.2281493

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**Editors:** Hang W., Hou X., Zhao B., Wang Z., Xie M., Shimura T., Yu J.
**Publisher:** SPIE

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**Language of Original Document:** English
**Abbreviated Source Title:** Proc SPIE Int Soc Opt Eng
2-s2.0-85040780565
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**Publication Stage:** Final
**Source:** Scopus

6) Carter, S.[a], Fisher, A.[b], Garcia, R.[c g], Gibson, B.[d], Marshall, J.[a e], Whiteside, I.[f]

**Atomic spectrometry update: Review of advances in the analysis of metals, chemicals and functional materials**
(2016) *Journal of Analytical Atomic Spectrometry*, 31 (11), pp. 2114-2164. Cited 12 times.

**DOI:** 10.1039/c6ja90044e

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**Publisher:** Royal Society of Chemistry

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**CODEN:** JASPE
**Language of Original Document:** English
**Abbreviated Source Title:** J Anal At Spectrom
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Název článku: **Spectroscopic investigations of high-energy-density plasma transformations in a simulated early reducing atmosphere containing methane, nitrogen and water**

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**Record 1 of 4**
**Title:** CHEMICAL ABIOGENESIS: ARTISTIC CONCEPT TURNED INTO SCIENTIFIC REALITY
**Author(s):** Civis, S (Civis, Svatopluk); Knizek, A (Knizek, Antonin); Civis, P (Civis, Petr)
**Source:** CHEMICKE LISTY **Volume:** 113 **Issue:** 4 **Pages:** 223-232 **Published:** 2019
**Abstract:** Scientists have been striving to find a theory which would describe the origin of life on Earth for centuries, so far without success. To succeed in solving these problems, one has to broaden their view, to approach the scientific subject from a philosophical standpoint, to set firmly a framework of the research and to define its borders. In order to asses the philosophical contribution of the work, one need not resort to new ideas only, because many ideas have already been expressed in the past. Such concepts are nowadays often remembered only in History of arts and Philosophy classes. In our recent article published in Nature Astronomy, we have presented a very complex model for the creation of methane and its reprocessing to more complex organic molecules including nucleic acid bases from simple gaseous precursors. The purpose of this work is to show the repeating cycle of the creation of complex molecules from CO2 and their subsequent destruction back to their basic parent molecules in the light of the 500-year-old idea of the creation of life by Hieronymus Bosch.
**Accession Number:** WOS:000464613600006
**ISSN:** 0009-2770
**eISSN:** 1213-7103

**Record 2 of 4**
**Title:** HNCO-based synthesis of formamide in planetary atmospheres
**Author(s):** Ferus, M (Ferus, M.); Laitl, V (Laitl, V.); Knizek, A (Knizek, A.); Kubelik, P (Kubelik, P.); Sponer, J (Sponer, J.); Kara, J (Kara, J.); Sponer, JE (Sponer, J. E.); Lefloch, B (Lefloch, B.); Cassone, G (Cassone, G.); Civis, S (Civis, S.)
**Source:** ASTRONOMY & ASTROPHYSICS **Volume:** 616 **Article Number:** A150 **DOI:** 10.1051/0004-6361/201833003 **Published:** SEP 5 2018
**Abstract:** Time-resolved Fourier transform infrared emission spectroscopy, Fourier transform absorption infrared spectroscopy, and high-resolution UV-VIS emission spectroscopy have been used to characterize the chemistry of isocyanic acid (HNCO) under glow discharge conditions in planetary atmospheres. HNCO mixtures (i.e., composed of di-hydrogen or ammonia) have been investigated in order to unveil the possible reaction pathways leading to the synthesis of the key prebiotic molecule formamide (HCONH2), upon planetary atmospheres containing isocyanic acid in presence of di-hydrogen and, separately, of ammonia. In addition, ab initio molecular dynamics simulations coupled with a modern metadynamics technique have been performed in order to identify the most likely chemical pathways connecting HNCO to formamide. It turned out that the direct hydrogenation of HNCO is thermodynamically favored. Incidentally, the experimental results - supplied by a simplified kinetic model - also proved the favorability of the reaction HNCO + H-2 -> HCONH2 which, moreover, spontaneously takes place in unbiased ab initio molecular dynamics simulations carried out under the effect of intense electric fields.
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|---|---|---|
| Kubelik, Petr | F-5240-2014 | |
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**ISSN:** 1432-0746

**Record 3 of 4**
**Title:** The origin of methane and biomolecules from a CO2 cycle on terrestrial planets
**Author(s):** Civis, S (Civis, Svatopluk); Knizek, A (Knizek, Antonin); Ivanek, O (Ivanek, Ondrej); Kubelik, P (Kubelik, Petr); Zukalova, M (Zukalova, Marketa); Kavan, L (Kavan, Ladislav); Ferus, M (Ferus, Martin)
**Source:** NATURE ASTRONOMY **Volume:** 1 **Issue:** 10 **Pages:** 721-726 **DOI:** 10.1038/s41550-017-0260-8 **Published:** OCT 2017
**Abstract:** Understanding the chemical evolution of newly formed terrestrial planets involves uncertainties in atmospheric chemical composition and assessing the plausibility of biomolecule synthesis. In this study, an original scenario for the origin of methane on Mars and terrestrial planets is suggested. Carbon dioxide in Martian and other planetary atmospheres can be abiotically converted into a mixture of methane and carbon monoxide by 'methanogenesis' on porous mineral photoactive surfaces under soft ultraviolet irradiation. On young planets exposed to heavy bombardment by interplanetary matter, this process can be followed by biomolecule synthesis through the reprocessing of reactive reducing atmospheres by impact-induced shock waves. The proposed mechanism of methanogenesis may help to answer the question concerning the formation of methane and carbon monoxide by photochemical processes, the formation of biomolecules on early Earth and other terrestrial planets, and the source and seasonal variation of methane concentrations on Mars.
**Accession Number:** WOS:000415270100010
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**ISSN:** 2397-3366

**Record 4 of 4**
**Title:** High Energy Radical Chemistry Formation of HCN- rich Atmospheres on early Earth
**Author(s):** Ferus, M (Ferus, Martin); Kubelik, P (Kubelik, Petr); Knizek, A (Knizek, Antonin); Pastorek, A (Pastorek, Adam); Sutherland, J (Sutherland, John); Civis, S (Civis, Svatopluk)
**Source:** SCIENTIFIC REPORTS **Volume:** 7 **Article Number:** 6275 **DOI:** 10.1038/s41598-017-06489-1 **Published:** JUL 24 2017
**Abstract:** Recent results in prebiotic chemistry implicate hydrogen cyanide (HCN) as the source of carbon and nitrogen for the synthesis of nucleotide, amino acid and lipid building blocks. HCN can be produced during impact events by reprocessing of carbonaceous and nitrogenous materials from both the impactor and the atmosphere; it can also be produced from these materials by electrical discharge. Here we investigate the effect of high energy events on a

range of starting mixtures representative of various atmosphere-impactor volatile combinations. Using continuously scanning time-resolved spectrometry, we have detected. CN radical and excited CO as the initially most abundant products. Cyano radicals and excited carbon monoxide molecules in particular are reactive, energy-rich species, but are resilient owing to favourable Franck-Condon factors. The subsequent reactions of these first formed excited species lead to the production of ground-state prebiotic building blocks, principally HCN.

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## Documents

1) Ferus, M.[a], Laitl, V.[a], Knizek, A.[a b], Kubelik, P.[a c], Sponer, J.[d], Kára, J.[a], Sponer, J.E.[d], Lefloch, B.[e], Cassone, G.[d], Civiš, S.[a]

**HNCO-based synthesis of formamide in planetary atmospheres**
(2018) *Astronomy and Astrophysics*, 616, art. no. A150, . Cited 1 time.

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2) Ferus, M.[a], Kubelík, P.[a], Knížek, A.[a], Pastorek, A.[a], Sutherland, J.[b], Civiš, S.[a]

**High Energy Radical Chemistry Formation of HCN-rich Atmospheres on early Earth**
(2017) *Scientific Reports*, 7 (1), art. no. 6275, . Cited 9 times.

**DOI:** 10.1038/s41598-017-06489-1

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3) Civiš, S.[a], Knížek, A.[a b], Ivanek, O.[a], Kubelík, P.[a c], Zukalová, M.[a], Kavan, L.[a], Ferus, M.[a]

**The origin of methane and biomolecules from a CO2 cycle on terrestrial planets**
(2017) *Nature Astronomy*, 1 (10), pp. 721-726. Cited 2 times.

**DOI:** 10.1038/s41550-017-0260-8

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Název článku: **Spontaneous oxygen isotope exchange between carbon dioxide and natural clays: Refined rate constants referenced to TiO2 (anatase/rutile)**

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**Record 1 of 3**

**Title:** Formation of Methane and (Per)Chlorates on Mars

**Author(s):** Civis, S (Civis, Svatopluk); Knizek, A (Knizek, Antonin); Rimmer, PB (Rimmer, Paul B.); Ferus, M (Ferus, Martin); Kubelik, P (Kubelik, Petr); Zukalova, M (Zukalova, Marketa); Kavan, L (Kavan, Ladislav); Chatzitheodoridis, E (Chatzitheodoridis, Elias)

**Source:** ACS EARTH AND SPACE CHEMISTRY **Volume:** 3 **Issue:** 2 **Pages:** 221-232 **DOI:** 10.1021/acsearthspacechem.8b00104 **Published:** FEB 2019

**Abstract:** Methane, perchlorates, chlorates, and methyl chlorides have all been detected on Mars. The origin of these species has never been adequately explained. In this paper, we irradiated mixtures of CO2, HCl, and a mineral catalyst-anatase, rutile, montmorillonite, and the Nakhla meteorite-with soft UV radiation for up to 3500 h and observed the formation of perchlorates, chlorates, methyl chlorides, and methane in a single experiment. Additionally, the methanogenesis for anatase was observed at -196 degrees C. Further, we propose that while methane is decomposed relatively quickly and therefore attains a steady-state concentration (0.41 +/- 0.16 ppbv), the chlorinated compounds are much more stable and therefore would have accumulated throughout the Martian history. We estimate that this mechanism would be sufficient in the course of Martian history to accumulate perchlorate in the soil in 0.5 wt % in 5-50 cm depth, which is in accordance with the observed perchlorate content on Mars. This predicted perchlorate gradient may be observed with the Insight rover. Further, if microbes are present on Mars, they will likely inhabit depths below the perchlorate (i.e., 5-50 cm). This chemistry likely still continues on Mars to a certain extent, and any future exploration by rovers or planetary models should account for this process during their analyses.

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**Record 2 of 3**

**Title:** CHEMICAL ABIOGENESIS: ARTISTIC CONCEPT TURNED INTO SCIENTIFIC REALITY

**Author(s):** Civis, S (Civis, Svatopluk); Knizek, A (Knizek, Antonin); Civis, P (Civis, Petr)

**Source:** CHEMICKE LISTY **Volume:** 113 **Issue:** 4 **Pages:** 223-232 **Published:** 2019

**Abstract:** Scientists have been striving to find a theory which would describe the origin of life on Earth for centuries, so far without success. To succeed in solving these problems, one has to broaden their view, to approach the scientific subject from a philosophical standpoint, to set firmly a framework of the research and to define its borders. In order to asses the philosophical contribution of the work, one need not resort to new ideas only, because many ideas have already been expressed in the past. Such concepts are nowadays often remembered only in History of arts and Philosophy classes. In our recent article published in Nature Astronomy, we have presented a very complex model for the creation of methane and its reprocessing to more complex organic molecules including nucleic acid bases from simple gaseous precursors. The purpose of this work is to show the repeating cycle of the creation of complex molecules from CO2 and their subsequent destruction back to their basic parent molecules in the light of the 500-year-old idea of the creation of life by Hieronymus Bosch.

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**Record 3 of 3**

**Title:** Comparative SIFT-MS, GC-MS and FTIR analysis of methane fuel produced in biogas stations and in artificial photosynthesis over acidic anatase TiO2 and montmorillonite

**Author(s):** Knizek, A (Knizek, Antonin); Dryahina, K (Dryahina, Ksenyia); Spanel, P (Spanel, Patrik); Kubelik, P (Kubelik, Petr); Kavan, L (Kavan, Ladislav); Zukalova, M (Zukalova, Marketa); Ferus, M (Ferus, Martin); Civis, S (Civis, Svatopluk)

**Source:** JOURNAL OF MOLECULAR SPECTROSCOPY **Volume:** 348 **Special Issue:** SI **Pages:** 152-160 **DOI:** 10.1016/j.jms.2017.10.002 **Published:** JUN 2018

**Abstract:** The era of fossil fuels is slowly nearing its inevitable end and the urgency of alternative energy sources basic research, exploration and testing becomes ever more important. Storage and alternative production of energy from fuels, such as methane, represents one of the many alternative approaches. Natural gas containing methane represents a powerful source of energy producing large volume of greenhouse gases. However, methane can be also produced in closed, CO2-neutral cycles. In our study, we compare detailed chemical composition of CH4 fuel produced in two different processes: Classical production of biogas in a rendering station, industrial wastewater treatment station and landfill gas station together with novel approach of artificial photosynthesis from CO2 over acidic anatase TiO2 in experimental apparatus developed in our laboratory. The analysis of CH4 fuel produced in these processes is important. Trace gaseous traces can be for example corrosive or toxic, low quality of the mixture suppresses effectivity of energy production, etc. In this analysis, we present a combination of two methods: High resolution Fourier transform infrared spectroscopy (HR-FTIR) suitable for the main component analysis; and the complementary extremely sensitive method of Selected Ion Flow Tube Mass Spectrometry (SIFT-MS) and gas chromatography (GC-MS), which are in turn best suited for trace analysis. The combination of these methods provides more information than any single of them would be able to and promises a new possible analytical approach to fuel and gaseous mixture analysis. (C) 2017 Published by Elsevier Inc.

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| Knizek, Antonin | N-9812-2014 | 0000-0002-0932-0380 |
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| Dryahina, Ksenyia | F-5258-2014 | 0000-0003-4247-3642 |

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Scopus

## Documents

1) Civiš, S.[a], Knížek, A.[a b], Rimmer, P.B.[c d e], Ferus, M.[a], Kubelík, P.[a f], Zukalová, M.[a], Kavan, L.[a], Chatzitheodoridis, E.[g]

**Formation of methane and (Per)chlorates on mars**
(2019) *ACS Earth and Space Chemistry*, 3 (2), pp. 221-232.

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2) Knížek, A.[a b], Dryahina, K.[a], Španěl, P.[a], Kubelík, P.[a c], Kavan, L.[a], Zukalová, M.[a], Ferus, M.[a], Civiš, S.[a]

**Comparative SIFT-MS, GC–MS and FTIR analysis of methane fuel produced in biogas stations and in artificial photosynthesis over acidic anatase TiO2 and montmorillonite**
(2018) *Journal of Molecular Spectroscopy*, 348, pp. 152-160. Cited 1 time.

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