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Workplace Health Promotion Program on Using Dietary Antioxidants (Anthocyanins) in Chemical Exposed Workers

2013-07-02

Workplace health promotion is a business management system that aims to promote and improve the health situations of all employees in a comprehensive and sustainable mode, and should be seen as an equal partner for occupational health and safety. Certain industrial hazards (in particular chemical agents) display oxidant capacity in the human body acting via oxidative stress, caused by a cellular excess of reactive oxygen and nitrogen species. Species like superoxide and hydrogen peroxide are involved in protein kinase regulation, while nitric oxide and peroxynitrite inactivate phosphatases as well as activating kinases, which are key agents for translating signals of cell needs into metabolic change through enzyme action, gene transcription, protein synthesis, and biochemical flux. These reactions are permanently balanced by the redox system, a non-equilibrium thermodynamic state as a basic part of aerobic life, determined by relative and constantly changing amounts of oxidative and antioxidative (reductive) agents. Review of a large number of studies shows that external sources of antioxidants, mainly fruits and vegetables, are a real benefit for human defence mechanisms, considering now that sufficient scientific evidence exists for public health policy to promote a plant-rich diet. In the present investigation, the authors focused on anthocyanins, as highly potent phytochemical antioxidants expected to protect us from oxidative injury. Furthermore, these specific antioxidants were found to act against lipoperoxidation and oxidative stress induced by industrial chemicals like carbon tetrachloride, parathion or heavy metals. Anthocyanin extracts of Vaccinium Myrtillus (bilberry) improve night vision and eyestrain caused by excessive computer use. Because of the antioxidant skin protection against UVB radiation, these phytochemicals can be used (both local and oral administration) by workers from oil-bearing platforms, furnaces or agriculture. The authors believe that such important findings may be used for workplace health promotion projects in chemical industry, in order to prevent occupational diseases or work-related diseases. The individual approach of workplace health promotion focuses on the health-related behaviours of employees, and is called risk factor reduction (educational approach). The authors focused their initiative on using dietary natural antioxidants by running health
Technical campaigns, and raising awareness of the harmful effects of chemical agents and xenobiotics, addressed both to employees and managers. A one-year project sustaining behaviour change mainly through educational and informative sessions; has been proposed, based on assessment of workers' needs and also on developing healthy lifestyles. In addition, the authors want to encourage company managers to offer antioxidant supplements/fresh fruits/berries juices to those employees who are working in harmful conditions, considering a daily estimate intake of 200 mg anthocyanins. Health promotion on consuming anthocyanins-rich fruits and vegetables may contribute in reducing age-related neurodegenerative diseases such as Parkinson’s disease and Alzheimer’s disease, age-related metabolic diseases (especially cardiovascular diseases), and not at least, cancer. Designing potent antioxidant phytococktails and standardised mixtures of anthocyanins for human consumption will be a great challenge on essentially interdisciplinary research topic involving interaction of nutritionists, physicians, chemists, pharmacists and others.

Authors: Stoia, M.; Oancea, S.
Full Source: Procedia Engineering 2013, Ahead of Print (English)

Elimination of perchlorates from water intended for human consumption: initial feedback
2013-07-02

This article provides a review of the treatment techniques considered for eliminating perchlorates, along with the main results obtained at the pilot scale, at the Flers (Lille) and Gamarde (Bordeaux) sites.

Various perchlorate salts can be used in many industrial applications, particularly the military and aerospace industries (rocket propellants, pyrotechnic devices, gunpowder, etc.). As soon as they were informed in 2010 of ammonium perchlorate emissions into the environment from an industrial plant, the Aquitaine and Midi Pyrenees Regional Health Authorities searched for perchlorates in water produced from catchments downstream of these emissions. The extension of this analysis campaign to all springs supplying the Bordeaux Metropolitan Area showed that approximately 1/4 were contaminated with perchlorates, at concentrations of circa 30 to 40 ìg/l. In October 2011, perchlorates were detected in the catchment area of several drinking water resources of the Lille Metropolitan Area, in particular that of Flers (content of circa 20 to 30 ìg/l). Since then, perchlorates have also been demonstrated in more
The aim of the current experiment was to test the efficacy and safety of Profermin in inducing remission in patients with active ulcerative colitis (UC). The study included 39 patients with mild to moderate UC defined as a Simple Clinical Colitis Activity Index (SCCAI) >4 and <12, who were treated open-label with Profermin twice daily for 24 weeks. Daily SCCAI was reported observed blinded via the Internet. It was found that in an intention to treat (ITT) analysis, the mean reduction in SCCAI score was 56.5%. Of the 39 patients, 24 reached the primary endpoint, which was proportion of patients with 50% reduction in SCCAI. The secondary endpoint, the proportion of patients in remission defined as SCCAI ≤2.5, was in ITT analysis reached in 18 of the 39 patients. In a repeated-measure
Technical

regression analysis, the estimated mean reduction in score was 5.0 points (95% CI: 4.1-5.9, P < 0.001) and the estimated mean time taken to obtain half the reduction in score was 28 d (95% CI: 26-30). There were no serious adverse events (AEs) or withdrawals due to AEs. Profermin was generally well tolerated. In conclusion, Profermin is safe and may be effective in inducing remission of active UC.

Authors: Krag, Aleksander; Israelsen, Hans; von Ryberg, Bjoern; Andersen, Klaus K.; Bendtsen, Flemming


Comparison on effect of composite general anaesthesia with tramadol intravenous injection at different doses

2013-07-02

The objective of this study was to compare the effect of composite general anaesthesia with tramadol intravenous injection at different doses. 214 Cases for general anaesthesia were randomly divided with T30 group (n=81), T25 group (n=40), T20 group (n=30), T15 group (n=33) and T10 group (n=30). All the cases were given 2.5 mg/kg propofol, 0.15 mg/kg vecuronium bromide and tramadol (30 mg/kg in T30 group, 25 mg/kg in T25 group, 20 mg/kg in T20 group, 15 mg/kg in T15 group and 10 mg/kg in T10 group). The maintenance of general anaesthesia were performed with 10 mg/(kg·h) propofol by a pump, the cases in T30 group were given 10 mg/kg tramadol in 30 min by a pump. The MAP increase rate in T10 group after trachea cannula was higher than the other four groups, and the HR increase rates in T10 and T15 groups were higher than the other three groups. The AP increase rate in T10 group after skin incision was higher than the other four groups, and the MAP stability index and HR stability index in T10 and T15 groups were higher than the other three groups. The T30 group could effectively inhibit cardiovascular response, blood pressure during anaesthesia, heart rate stability, fast consciousness, no irritating cough, dysphoria and chill during trachea cannula, extubation and skin incision, its post-operative analgesia excellence rate was >80%. The 30 mg/kg tramadol was with the optimal anaesthetic effect.

Authors: Liu, Hua; Lu, Dongsen; Zhou, Qian; Liu, Huanjie; Liu, Yuxia; Wei, Xuechun

Full Source: Xiandai Zhongxiyi Jiehe Zazhi 2011, 20(32), 4124-4126 (Ch)
The effect of erythropoietin on normal and neoplastic cells
2013-07-02
Erythropoietin (Epo) is an essential hormone that binds and activates the Epo receptor (EpoR) resident on the surface of erythroid progenitor cells, thereby promoting erythropoiesis. Recombinant human erythropoietin has been used successfully for over 20 years to treat anaemia in millions of patients. In addition to erythropoiesis, Epo has also been reported to have other effects, such as tissue protection and promotion of tumour cell growth or survival. This became of significant concern in 2003, when some clinical trials in cancer patients reported increased tumour progression and worse survival outcomes in patients treated with erythropoiesis-stimulating agents (ESAs). One of the potential mechanisms proffered to explain the observed safety issues were that functional EpoR was expressed in tumours and/or endothelial cells, and that ESAs directly stimulated tumour growth and/or antagonised tumour ablative therapies. Since then, numerous groups have performed further research evaluating this potential mechanism with conflicting data and conclusions. In the present study, the authors reviewed the biology of endogenous Epo and EpoR expression and function in erythropoiesis, and evaluated the evidence pertaining to the expression of EpoR on normal nonhematopoietic and tumour cells.

Authors: Elliott, Steve; Sinclair, Angus M.

Full Source: Biologics: Targets & Therapy [online computer file] 2012, 6, 163-189 (Eng)

Evolution of Insulin Development: Focus on Key Parameters
2013-07-02
Although insulin products and treatment strategies have improved significantly, clinical challenges still exist. Meeting glycaemic goals while minimising glucose variability and hypoglycaemia is of utmost importance when considering existing insulin therapies and designing investigational insulin treatments. A PubMed search identified relevant, peer-reviewed articles related to the evolution of insulin development for this nonsystematic review. Search terms included “animal insulin,” “synthetic insulin,” “regular human insulin,” “insulin lispro,” “insulin aspart,” “insulin glulisine,” “insulin glargine,” “insulin detemir,” “insulin degludec,” “biphasic human insulin,” “insulin premixes,” “ultra-long acting,” “oral insulin,” and...
“inhaled insulin.” While the discovery of animal insulin significantly decreased mortality rates from diabetes, issues with availability and large variability between batches led to difficulty in determining proper doses and, subsequently, challenges in achieving glycaemic control and avoiding hypoglycaemia. The development of synthetic insulin created a more readily available supply, but hypoglycaemia still persisted. Recombinant DNA technology solved insulin production problems and allowed for the development of better retarding agents, but pharmacokinetic/pharmacodynamic profiles still did not mimic natural insulin. Insulin premixes offered improved glycaemic control, decreased intrapatient variability versus self-mixing, and required fewer injections per day; however, patient adherence remained a problem due to the need to inject 30-60 min before a meal for optimal control. This prompted the development of rapid-acting insulin analogues that could be injected right before a meal and long-acting insulin analogues with flatter time-action profiles. In conclusion, despite advances in insulin development, a need to provide more physiology basal insulin coverage and reduce hypoglycaemic risk in patients with diabetes remains. Newer insulin analogues and more convenient routes of insulin delivery have shown promising safety and efficacy results. Many patients with diabetes have not reached glycaemic goals on currently available insulins. Additional studies are necessary to tailor optimal insulin delivery strategies to specific subsets of diabetes patients.

Author: Tibaldi, Joseph M.

Full Source: Advances in Therapy [online computer file] 2012, 29(7), 590-619 (Eng)

Human T cell priming assay (hTCPA) for the identification of contact allergens based on naive T cells and DC - IFN-γ and TNF-r readout

2013-07-02

Many small protein reactive organic and inorganic chemicals can cause allergic contact dermatitis, a T cell mediated inflammatory skin disease. In vitro alternatives to animal testing are needed for the identification of chemicals that pose such risks to human health. In this study, the authors have published the standard operation procedure for a human T cell priming assay developed primarily for the identification of contact allergens within the integrated EU project Sens-it-iv. This multiparametric flow cytometry based assay identifies chemical specific T cells based on
In this study, the authors aimed to use estimates of lung deposition after occupational exposure to nanomaterials to recommend in vitro testing concentrations for the U.S. Environmental Protection Agency’s ToxCast program.

Informing selection of nanomaterial concentrations for ToxCast in vitro testing based on occupational exposure potential

2013-07-02

Little justification is generally provided for selection of in vitro assay testing concentrations for engineered nanomaterials (ENMs). Selection of concentration levels for hazard evaluation based on real-world exposure scenarios is desirable. In this study, the authors aimed to use estimates of lung deposition after occupational exposure to nanomaterials to recommend in vitro testing concentrations for the U.S. Environmental Protection Agency’s ToxCast program. Testing concentrations are provided for carbon nanotubes (CNTs) and titanium dioxide (TiO₂) and silver (Ag) nanoparticles (NPs). Published ENM concentrations measured in air in manufacturing and R&D (research and development) labs were reviewed to identify input levels for estimating ENM mass retained in the human lung using the multiple-path particle dosimetry (MPPD) model. Model input parameters were individually varied to estimate alveolar mass retained for different particle sizes (5–1,000 nm), aerosol concentrations (0.1 and 1 mg/m³), aspect ratios (2, 4, 10, and 167), and exposure durations.

their frequency and antigen-specific production of the cytokines IFN-γ and TNF-R at the single cell level. Using sorted naïve T cells and monocyte-derived dendritic cells pulsed with the test chemical or with chemical-protein conjugates, the successful priming of an antigen-specific T cell response is controlled after antigen specific restimulation by cytokine readout. As the most specific response of the immune system to contact allergens the analogy of the chemical-specific T cell response may be a useful in vitro assay for hazard identification in immunotoxicology. This assay may be a valuable, highly specific element of an integrated testing strategy for the identification of chemicals and drugs that cause T cell mediated respiratory or gastrointestinal tract hypersensitivities or adverse drug reactions.

Authors: Richter, Anne; Schmucker, Sonja S.; Esser, Philipp R.; Traska, Verena; Weber, Verena; Dietz, Lisa; Thierse, Hermann-Josef; Pennino, Davide; Cavani, Andrea; Martin, Stefan F.

Full Source: Toxicology In Vitro [online computer file] 2013, 27(3), 1180-1185 (Eng)
The current study aims to determine the extent of genotoxic damage in relation to the duration of exposure to nickel and hexavalent chromium via micronuclei induction and other nuclear anomalies.

The electroplating industry commonly involves the use of nickel and chromium. An assessment of the genotoxic effects of these metals can be carried out by micronucleus (MN) test in buccal cells. Other nuclear anomalies (NA) observed in buccal cells such as karyorrhexis, pyknosis and karyolysis are also the indicators of genotoxicity. The current study aims to determine the extent of genotoxic damage in relation to the duration of exposure to nickel and hexavalent chromium via micronuclei induction and other nuclear anomalies. The present investigation included 150 subjects of which 50 individuals with no history of nickel/chromium exposure (Group I) were taken as control, 50 electroplaters exposed to nickel and hexavalent chromium for duration of less than 10 years (Group II) and 50 electroplaters exposed for g10 years (Group III) were included. Slides of buccal cells were prepared and the frequency of MN (%) and NA (%) were calculated. ANOVA was applied to test significance. The results were considered significant at p < 0.05 and p< 0.001. Group III showed the highest MN frequency (1.08 (0.54‰, p < 0.05), karyorrhexis (20.75 (6.29, p < 0.05), karyolysis (3.50 (1.91, p < 0.001), binucleate (4.75 (2.75, p < 0.05) and enucleated cells (5.75 (1.70, p < 0.05). Significant increase in
In the present study, the authors analysed occupational hazards and health damage of employees from a casting factory. Dust and noise exceeded the recommended standards. In 90 silicon sieving, silicon mixing, shaping and silicon cleaning workers contacted with dust, 46% had increased lung markings. In 40 silicon cleaning workers contacted with noise, 18% had hearing loss. In 10 workers contact with benzene, toluene, xylene, 40% had decreased Hb. The author concluded that based on the findings from this study, process and technology in the casting factory should be improved, and self-protection awareness of worker should be strengthen.

Author: Ding, Lu

Full Source: Zhonghua Yixue Shijian Zazhi 2010, 9(6), 369-370 (Ch)

Investigation and assessment on current status of occupational hazard in a certain aluminium electrolytic plant

2013-07-02

Through identification and analysis of occupational hazards in an aluminium plant, the critical control points were determined and preventive measures were proposed. The results showed that occupational hazards like dust and noise existed in strapping, electrolysing and electrical welding of storage warehouse, ingot casting and anode casting. The authors concluded that the occupational hazards could be harmful.
In this study, the authors investigated the oxidative stress reaction in workers exposed to low levels of phosgene. A total of 179 workers exposed to low level of phosgene were selected, and another 153 healthy workers exposed to no occupational health hazard were taken as controls. The serum content of malondialdehyde (MDA) and the serum activities of superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px) were detected. The results showed that the content of MDA and the activity of SOD in serum of workers exposed to low level of phosgene were higher than those of controls (P < 0.01). The serum activity of GSH-Px was lower in serum of workers exposed to low level of phosgene than in serum of controls, but there was statistical difference in workers younger than 30 years (P < 0.05).

Authors: Liu, Jing; Shou, Yongming; Zhang, Ye; Zhang, Jin; Bao, Xiaolu; Jin, Fusheng

Full Source: Zhongguo Gongye Yixue Zazhi 2011, 24(5), 386-387 (Ch)

**Public Health**

Oxidative stress and cytokine expression in respiratory epithelial cells exposed to well-characterised aerosols from Kabul, Afghanistan

In this study aerosol samples collected in Kabul, Afghanistan were compared to PM samples collected in a European location with traffic (Umea, Sweden) and a reference urban dust material (SRM 1649b). The toxicity of each sample towards normal human bronchial epithelial (NHBE) cells and a human bronchial epithelial cell line (BEAS-2B) was tested along with their ability to induce reactive oxygen species (ROS) formation.
This study characterised the association between residential pesticide application and acute and chronic respiratory symptoms in children, focusing on the location of the pesticide application in and around the home and the type of pesticide applicator (professional versus non-professional).

Authors: Ekstrand-Hammarstroem, Barbro; Magnusson, Roger; Oesterlund, Camilla; Andersson, Britt M.; Bucht, Anders; Wingfors, Haakan

Full Source: Toxicology In Vitro [online computer file] 2013, 27(2), 825-833 (Eng)

Residential Pesticide Use Is Associated With Children’s Respiratory Symptoms

2013-07-02

This study characterised the association between residential pesticide application and acute and chronic respiratory symptoms in children, focusing on the location of the pesticide application in and around the home and the type of pesticide applicator (professional versus non-professional). The authors used 1999 to 2004 National Health and Nutrition Examination Survey results to investigate this association in children younger than 18 years (N ) 14,065). The results showed that overall, pesticide use in the home was not associated with wheezing (odds ratio [OR], 1.15; 95% confidence interval [CI], 0.91 to 1.47). Nevertheless, pesticide use in the kitchen or dining rooms was significantly associated with increased odds of wheezing (OR, 1.39; 95% CI, 1.08 to 1.78) and dry cough (OR, 2.38; 95% CI, 1.40 to 4.06) after controlling for covariates. The authors concluded that these findings suggest that residential use of pesticides and the location of pesticide application are associated with increased respiratory complaints.

and inflammatory responses. The extracts morphology and elemental composition was studied by SEM-EDXRF, and filter samples were analysed for metals and organic compounds. The PM from Kabul contained a larger fraction of fine particles, 19 times more polyaromatic hydrocarbons (PAH) and 37 times more oxygenated PAH (oxy-PAH) compared to samples from Umea. The PM-samples from Kabul and the reference (SRM 1649b) induced significantly stronger oxidative stress responses than the samples from Umea. Furthermore, samples collected in Kabul induced significantly higher secretion of the cytokines IL-6, IL-8 and GM-CSF while SRM1649b induced a cytokine pattern more similar to samples collected in Umea. Several properties of the particles could potentially explain these differences, including differences in their size distribution and contents of PAH and oxy-PAH, possibly in combination with their relative transition metal contents.
The total concentration and size distribution of bioaerosols in three different types of housing (single room in shared accommodation [type I], single bedroom flat in three-story building [type II] and two- or three-bedroom detached houses [type III]) was assessed during the winter. This research was an extension of a previous study carried out in the summer. The measurement campaign was undertaken in winter 2008 and 30 houses were sampled. Samples were taken from kitchens, living rooms, corridors (only in housing type I) and outdoors with an Anderson 6 stage viable impactor. In housing type I, the total geometric mean concentration was highest in the corridor for both bacteria and fungi (3,171 and 1,281 CFU/m³, respectively). In type II residences, both culturable bacteria and fungi were greatest in the living rooms (3,487 and 833 CFU/m³, respectively). The living rooms in type III residences had largest number of culturable bacteria (1,361 CFU/m³) while fungi were highest in kitchens (280 CFU/m³). The concentrations of culturable bacteria and fungi were greater in mouldy houses than non-mouldy houses. A considerable variation was seen in the size distribution of culturable bacteria in type I residences compared to types II and III. For all housing types more than half of culturable bacterial and fungal aerosol were respirable (<4.7 μm) and so have the potential to penetrate into lower respiratory system. Considerable variation in concentration and size distribution within different housing types in the same geographic region highlights the impact of differences in design, construction, use and management of residential built environment on bioaerosols levels and consequent varied risk of population exposure to airborne biological agents.

Authors: Xu, Xiaohui; Nembhard, Wendy N.; Kan, Haidong; Becker, Alan; Talbott, Evelyn O.

Full Source: Journal of Occupational and Environmental Medicine [online computer file] 2012, 54(10), 1281-1287 (Eng)

Winter Time Concentrations and Size Distribution of Bioaerosols in Different Residential Settings in the UK

2013-07-02

The total concentration and size distribution of bioaerosols in three different types of housing (single room in shared accommodation [type I], single bedroom flat in three-story building [type II] and two- or three-bedroom detached houses [type III]) was assessed during the winter. This research was an extension of a previous study carried out in the summer. The measurement campaign was undertaken in winter 2008 and 30 houses were sampled. Samples were taken from kitchens, living rooms, corridors (only in housing type I) and outdoors with an Anderson 6 stage viable impactor. In housing type I, the total geometric mean concentration was highest in the corridor for both bacteria and fungi (3,171 and 1,281 CFU/m³, respectively). In type II residences, both culturable bacteria and fungi were greatest in the living rooms (3,487 and 833 CFU/m³, respectively). The living rooms in type III residences had largest number of culturable bacteria (1,361 CFU/m³) while fungi were highest in kitchens (280 CFU/m³). The concentrations of culturable bacteria and fungi were greater in mouldy houses than non-mouldy houses. A considerable variation was seen in the size distribution of culturable bacteria in type I residences compared to types II and III. For all housing types more than half of culturable bacterial and fungal aerosol were respirable (<4.7 μm) and so have the potential to penetrate into lower respiratory system. Considerable variation in concentration and size distribution within different housing types in the same geographic region highlights the impact of differences in design, construction, use and management of residential built environment on bioaerosols levels and consequent varied risk of population exposure to airborne biological agents.

Authors: Nasir, Zaheer Ahmad; Colbeck, Ian

Full Source: Water, Air, & Soil Pollution [online computer file] 2012, 223(9), 5613-5622 (Eng)
Human Health Risk Assessment of 16 Priority Polycyclic Aromatic Hydrocarbons in Soils of Chattanooga, Tennessee, USA

2013-07-02

South Chattanooga has been home to foundries, coke furnaces, chemical, wood preserving, tanning, and textile plants for over 100 years. Most of the industries were in place before any significant development of residential property in the area. During the 1950s and 1960s, however, the government purchased inexpensive property and constructed public housing projects in South Chattanooga. Many neighbourhoods that surround the Chattanooga Creek were previous dumping grounds for industry. Polycyclic aromatic hydrocarbons (PAHs) comprised the largest component of the dumping and airborne industrial emissions. To address human exposure to these PAHs, a broad study of South Chattanooga soil contaminant concentrations was conducted on 20 sites across the city. Sixteen priority pollutant PAHs were quantified at two depths (0-10 and 10-20 cm) and compared against reference site soils, as well as to soils from industrially impacted areas in Germany, China, and the USA. From these data, the probability that people would encounter levels exceeding the United States Environmental Protection Agency (USEPA) residential preliminary remediation goals (PRG) was calculated. The results indicate that South Chattanooga soils have relatively high concentrations of total PAHs, specifically benzo[a]pyrene (B[a]P). These high concentrations of B[a]P were somewhat ubiquitous in South Chattanooga. Indeed, there is a high probability (88%) of encountering soil in South Chattanooga that exceeds the USEPA PRG for B-[a]P. However, there is a low probability (15%) of encountering a site with PAHs exceeding USEPA PRG guidelines.

Authors: Hussar, Erika; Richards, Sean; Lin, Zhi-Qing; Dixon, Robert P.; Johnson, Kevin A.

Full Source: Water, Air, & Soil Pollution [online computer file] 2012, 223(9), 5535-5548 (Eng)

High prevalence of childhood asthma in Northern Israel is linked to air pollution by particulate matter: evidence from GIS analysis and Bayesian Model Averaging

2013-07-02

The medical records of 3922 school children residing in the Greater Haifa Metropolitan Area in Northern Israel were analysed. Individual exposure
In this study, the authors discuss some options on how to integrate safety into the design, selection, layout, or maintenance of equipment typically used in the water treatment industry.

Incorporating safety into water treatment design

2013-07-02

Safety First: Designing a water treatment system to incorporate safety is a complex mix of design and operating conditions and parameters; appropriate equipment and material specification and selection; control systems design for safe operational or failure conditions; and proper maintenance. The equipment must be designed not only to operate properly and efficiently, but also for operator safety including adding additional, sometimes “optional”, safety equipment such as: flange guards, desiccant breathers on chemical tanks, and relief valves. Water treatment equipment frequently includes chemical treatment, which requires safe handling, material selection for corrosion resistance, and storage. In addition to specifying proper equipment, the water treatment systems to ambient air pollution (SO2 and PM10) for each child was estimated using Geographic Information Systems tools. Factors affecting childhood asthma risk were then investigated using logistic regression and the more recently developed Bayesian Model Averaging (BMA) tools. The analysis reveals that childhood asthma in the study area appears to be significantly associated with particulate matter of less than 10 μm in aerodynamic diam. (PM10) (Odds Ratio (OR) ) 1.11; P < 0.001). However, no significant association with asthma prevalence was found for SO2 (P > 0.2), when PM10 and SO2 were introduced into the models simultaneously. When considering a change in PM10 between the least and the most polluted parts of the study area (9.4 μg/m³), the corresponding OR, calculated using the BMA analysis, is 2.58 (with 95% posterior probability limits of OR ranging from 1.52 to 4.41), controlled for gender, age, proximity to main roads, the town of a child’s residence, and family’s socio-economic status. The authors concluded that exposure to airborne particular matter, even at relatively low concentrations (40-50 μg/m³), generally below international air pollution standards (55-70 μg/m³), appears to be a considerable risk factor for childhood asthma in urban areas. This should be a cause of concern for public health authorities and environmental decision-makers.

Authors: Portnov, Boris A.; Reiser, Benjamin; Karkabi, Khaled; Cohen-Kastel, Orit; Dubnov, Jonathan

In this study, the authors describe an invention relating to a process for a fail-safe detection of failure of an exhaust device in a vacuum deposition system. The system comprising at least one vacuum pump operably connected to a scrubber that is connected to exhaust device, the exhaust device having at least one each motor and blower, and a suction duct; an electronic control device remotely controlling the system by sensing the pressure at the inlet and exhaust duct and controlling the valves, the control device having a plurality of safety interlocks and via a two core connected wire to a spring loaded microswitch having a lever, and at least one NO and NC contacts, and disposed on said exhaust duct, wherein the microswitch is provided with a flap which extends the length of said lever and enables the micro-switch to operate with enhanced sensitivity, the process comprising the steps of manually changing the normal position (A) of the flap switch to a position B to activate the exhaust device, and the flap getting stuck on the outlet of the exhaust duct due to suction pressure; resetting the safety interlocks by manipulating the control device; the flap switch repositioned at location (A) in case of any failure of
the exhaust device enabling the emergency power off (EPO) to activate which in turn deactivates the toxic gas valves.

Authors: Saxena, Anil Kumar; Reddy, S. Raghunath; Sharma, Sushil Kumar

Full Source: Indian Pat. Appl. IN 2011 KO 211 (Cl. C23C), 26 Oct 2012, Appl. 2011/KO211, 18 Feb 2011; 15pp (Eng)

**Fuel gas safety detection and prediction warning system**

2013-07-02

This study discusses the fuel gas safety detection and prediction warning system. The warning system includes g1 fuel gas user safety warning terminal, g1 concentrator and a supervision service centre. The fuel gas user safety-warning terminal is disposed at the side of the user, and is in short-distance wireless both-way communication with the concentrator through a wireless transceiver. The concentrator is in both-way communication with the fuel gas user safety warning terminal through the short-distance wireless communication, and is in wireless both-way communication with the supervision service center through public network, and data and control commands are transmitted in both ways between the fuel gas user safety warning terminal and the supervision service centre. The supervision service center is disposed at the side of the fuel gas supervision, receives data transmitted by the fuel gas user safety warning terminal through the public network, sends control commands or data through the public network, and transmits to the fuel gas user safety warning terminal through the concentrator.

Authors: Yu, Yuezhong; Niu, Jun; Zang, Li

Full Source: Faming Zhuanli Shenqing CN 102,903,210 (Cl. G08B21/16), 30 Jan 2013, Appl. 10,352,696,20 Sep 2012; 17pp. (China)