Contents

(click on page numbers for links)

**ENVIRONMENTAL**
The comparative impact of textile, tannery and sewage effluents on seed germination, biomass, leaf area, root development and chlorophyll contents in French bean (Phaseolus vulgaris L.) ........................................... 3
Use of Artificial Stream Mesocosms to Investigate Mercury Uptake in the South River, Virginia, USA................................................................. 3

**MEDICAL**
Effects of policosanol on serum lipid profile and heme oxygenase-1 in patients with hyperlipidemia................................................................. 4
Clinical study of correlation between the expression of ICBP90 and hematopoietic suppression in patients with chronic benzene poisoning... 5
Effects of lead acetate on the biological characteristics of human umbilical cord mesenchymal stem cells ....................................................... 6
Nucleotide excision repair is not induced in human embryonic lung fibroblasts treated with environmental pollutants..................................... 7
Perflurooctanoic acid induces apoptosis through the p53-dependent mitochondrial pathway in human hepatic cells: A proteomic study ................................................................. 8

**OCCUPATIONAL**
Effects of industrial noise on high frequency hearing loss and transaminase in workers....................................................................................... 8
A survey of basic occupational health services in a smelting enterprise .... 9
Occupational hazards monitoring and analysis in a coalmine of Henan Province................................................................................................. 10
Occupational hazards in workplace of an ethylene plant.......................... 10
Pre-evaluation of occupational hazards in a coal mining enterprise of large washing set of key equipment..................................................... 11

**PUBLIC HEALTH**
mRNA expression of oncogenes in patients with allergic dermatitis induced by trichloroethylene ................................................................. 11
One case of elderly patient death induced by high-dose atrazine poisoning ................................................................. 12
Contents

Neuroendocrine mechanisms of the pathology development in patients who endured an acute intoxication by organophosphorous agents .................................................................13
Hormonal contraceptives and arterial disease: An epidemiological update .................................................................................................................................13

SAFETY
High-safety light-weight integrated exhaust device with good firmness for agricultural vehicle.................................................................14
Ferric bromide demercurizing composite liquid and method for removal of mercury from flue gas using the same .............................................15
Alkaline powder for disposing leaked liquid chlorine and chlorine gas and its preparation method. ..............................................................15
ENVIRONMENTAL

The comparative impact of textile, tannery and sewage effluents on seed germination, biomass, leaf area, root development and chlorophyll contents in French bean (Phaseolus vulgaris L.)

2014-04-08

The use of industrial and sewage wastewater for irrigation purpose has emerged as an important way of utilisation of the presence of considerable quantities of essential elements and minimising its pollution load. In view of such perspectives, an experiment was conducted to examine the comparative effect of textile, tannery and sewage effluents on seed germination, biomass, leaf area, chlorophyll content and root development in French bean (Phaseolus vulgaris L.) plants. Plants exhibited a marked reduction in seed germination and other physiological parameters when grown with higher concentrations (50 and 100 %) of all the three effluents. However, the effect was promotive when plants were raised with lower concentrations. The effect of tannery effluent was more deleterious on all parameters as compared with textile and sewage effluents. The overall impact of the three effluents was tannery > textile > sewage in descending order of their toxicity. It was suggested that the effluent released from industrial establishments i.e., textile and sewage in particular, may be used for raising crops after appropriate dilution. This may facilitate the availability of essential nutrients and irrigation water, which are often in scarcity. However, this recommendation needs further extensive studies with different kinds of effluents and plant species. In addition, this phytoremedial approach may also contribute substantially towards eco-friendly disposal of industrial effluents, a cumbersome problem for the management and farmers as well.

Author: Khan, M. Gufran

Full Source: Environmental Science: An Indian Journal 2013, 8(8), 308-314 (English)

Use of Artificial Stream Mesocosms to Investigate Mercury Uptake in the South River, Virginia, USA

2014-04-08

Mercury is a globally distributed pollutant that biomagnifies in aquatic food webs. In the United States, 4,769 water bodies fail to meet criteria
The purpose of the research is to evaluate the effects of policosanol on serum lipid profile and heme oxygenase-1 (HO-1) in patients with hyperlipidemia.

Authors: Brent, Robert N.; Berberich, David A.

Full Source: Archives of Environmental Contamination and Toxicology 2013, Ahead of Print (English)

MEDICAL

Effects of policosanol on serum lipid profile and heme oxygenase-1 in patients with hyperlipidemia

2014-04-08

The purpose of the research is to evaluate the effects of policosanol on serum lipid profile and heme oxygenase-1 (HO-1) in patients with hyperlipidemia.
In the present study, the authors observed the change of ICBP90 expression in patients with chronic benzene poisoning and the correlation between the expression of ICBP90 and benzene-induced hematotoxicity was explored.
This study explored the effect of lead acetate on the biological characteristics of hUC-MSCs.

**Effects of lead acetate on the biological characteristics of human umbilical cord mesenchymal stem cells**

**2014-04-08**

The effects of lead acetate on the activity of hUC-MSCs were investigated by cell count. Cell apoptosis was detected by FCM. The authors also studied the differentiation potency of MSCs through bone induction, and then detected the expression of ALP, TPO, SCF and VEGF were detected by RT-PCR or quantitative PCR. The results displayed that lead acetate could restrain the growth of MSCs. Lead acetate could increase the ratio of hUCMSCs apoptosis at the concentration of 60 μmol/L. The ratio of ALP and cytokines expression was lower. This suggests that lead acetate can restrain the proliferation of hUC-MSCs, promote its apoptosis and degrade its multi-directional differentiation potentiality.

Authors: Sun, Xiaochun; Wu, Lele; Xie, Yan; Zhu, Wei; Chen, Qiaolin; Xu, Wenrong

Full Source: Zhongguo Xibao Shengwuxue Xuebao 2012, 34(2), 168-173 (Ch)

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of BMNCs in 11 chronic benzene-poisoning cases with hematopoietic regeneration was significantly higher than those in controls and 13 chronic benzene-poisoning cases with hematopoietic suppression (P<0.05 or P<0.01), respectively. There were good correlations between the expression of ICBP90 and white blood cell and platelet counts in patients with chronic benzene poisoning (r1)0.555, P<0.06; r2)0.854, P<0.01). The ICBP90 expression of BMNCs in the chronic benzene poisoning cases with hematopoietic suppression decreased significantly, and the ICBP90 expression of BMNCs in the chronic benzene poisoning cases with hematopoietic regeneration increased significantly. There was good correlation between hematopoietic suppression and ICBP90 expression in patients with chronic benzene poisoning.

Authors: Luo, Sheng; Huang, Xiao-yan; Hu, Qian; Hu, Xu-dong; Xing, Chong-yun; Yu, Kang

Full Source: Zhonghua Laodong Weisheng Zhiyebing Zazhi 2012, 30(8), 571-574 (Ch)
In this study, the authors used normal human embryonic lung fibroblasts (HEL12469 cells) and tested their response to treatment with benzo[a]pyrene (B-[a]P) and extractable organic matter (EOM) from ambient air particles <2.5 μm (PM2.5) collected in 2 Czech cities differing in levels and sources of air pollution. Multiple endpoints associated with exposure to polycyclic aromatic hydrocarbons (PAHs) including the levels of bulky DNA adducts and the nucleotide excision repair (NER) response [expression of XPE, XPC and XPA genes on the level of mRNA and proteins, unscheduled DNA synthesis (UDS)] were analysed. EOMs were collected in the winter and summer of 2011 in 2 Czech cities with different levels and sources of air pollution. The effects of the studied compounds were analysed in the presence (+S9) and absence (-S9) of the rat liver microsomal S9 fraction. The levels of bulky DNA adducts were highest after treatment with B[a]P, followed by winter EOMs; their induction by summer EOMs was weak. The induction of both mRNA and protein expression was observed, with the most pronounced effects after treatment with B[a]P (-S9); the response induced by EOMs from both cities and seasons was substantially weaker. The expression of DNA repair genes was not accompanied by the induction of UDS activity. In summary, these results indicate that the tested compounds induced low levels of DNA damage and affected the expression of NER genes; however, nucleotide excision repair was not induced.

Authors: Rossner, Pavel, Jr.; Mrhalkova, Andrea; Uhlírova, Katerina; Spatova, Milada; Rossnerova, Andrea; Libalova, Helena; Schmuczerova, Jana; Milcova, Alena; Topinka, Jan; Sram, Radim J.

Full Source: PLoS One [online computer file] 2013, 8(7), e69197 (Eng)
Perfluorooctanoic acid induces apoptosis through the p53-dependent mitochondrial pathway in human hepatic cells: A proteomic study

2014-04-08

Perfluorooctanoic acid (PFOA) is one of the most commonly used perfluorinated compounds, and exposure to it has been associated with a number of adverse health effects. However, the molecular mechanisms involved in PFOA toxicity are still not well characterised. In the present study, flow cytometry analysis revealed that PFOA induced oxidative stress, cell cycle arrest and apoptosis in human non-tumour hepatic cells (L-02). Furthermore, the authors investigated the alterations in protein profile within L-02 cells exposed to PFOA, aiming to explore the mechanisms underlying PFOA hepatotoxicity on the proteome level. Of the 28 proteins showing significant differential expression in response to PFOA, 24 were down-regulated and 4 were up-regulated. This proteomic study proposed that the inhibition of some proteins, including Grp78, Hsp27, CTSD and hnRNPC may be involved in the activation of p53, which consequently triggered the apoptotic process in L-02 cells. Induction of apoptosis via the p53-dependent mitochondrial pathway is further suggested as one of the key toxicological events occurring in L-02 cells under PFOA stress. The authors hope these data will shed new light on the molecular mechanisms responsible for PFOA-mediated toxicity in human liver cells, and from such studies useful biomarkers indicative of PFOA exposure could be developed.

Authors: Huang, Qingyu; Zhang, Jie; Martin, Francis L.; Peng, Siyuan; Tian, Meiping; Mu, Xiaoli; Shen, Heqing

Full Source: Toxicology Letters [online computer file] 2013, 223(2), 211-220 (Eng)

OCCUPATIONAL

Effects of industrial noise on high frequency hearing loss and transaminase in workers

2014-03-25

In this study, the authors investigated the effect of occupational noise exposure on the prevalence of high frequency hearing loss (HFHL) as well as the activities of serum glutamic-oxaloacetic transaminase (SGOT), glutamate-pyruvate transaminase (GPT) and glutamyl transpeptidase
Technical

(GTP) in workers. A cross-sectional epidemiological study, including health examination and hearing test, was conducted among 716 workers exposed to industrial noise and 133 controls without noise exposure. Their prevalence of HFHL and serum transaminase were compared and analysed. The results demonstrated that the prevalence of HFHL in the noise exposure group (30.73%) was significantly higher than of the controls (23.31%) (X² = 6.347, P = 0.012). The prevalence of HFHL in the noise exposure group was increase with age (linear-by-linear association X² = 4.917, P = 0.027) and noise exposure years (linear-by-linear association X² = 66.241, P = 0.000). Compared with the control group, the serum SGOT (t = 3.185, P = 0.002), GPT (t = 2.907, P = 0.004), and GTP (t = 2.801, P = 0.006) were all increased greatly in the noise exposure group. the authors concluded that the findings suggest that hearing loss can be caused by long-term noise exposure. In addition, noise can induce changes in activities of serum transaminase.

Authors: Xue, Lai-jun; Zhang, Da-jun; Yan, Ling; Li, Li

Full Source: Huanjing Yu Zhiye Yixue 2012, 29(10), 638-640 (Ch)

A survey of basic occupational health services in a smelting enterprise

2014-03-25

This study investigated the basic occupational health services (BOHS) status of metallurgical enterprises in economically underdeveloped regions, as well as their supervision and management levels, so as to provide reference for similar areas. Workers of a smelting enterprise were asked to answer a questionnaire. In addition, dust concentrations were monitored within this enterprise and heavy metal contents in workers’ hair were detected. The major occupational hazards detected in this enterprise were noise, dust, irritant chemicals, metal fume, etc. Only 37% workers were covered by BOHS, and 63.2% of them were aware of knowledge of occupational protection. There are a variety of occupational hazards in production process, and therefore corresponding control measures, such as dust suppression and noise reduction, should be taken to improve operating environment. the authors concluded that the BOHS in this enterprise, according to local situation, should be gradually improved and popularised.

Authors: Cui, Yao-kang; He, Zuo-shun

Full Source: Huanjing Yu Zhiye Yixue 2012, 29(10), 648-651 (Ch)

This study investigated the basic occupational health services (BOHS) status of metallurgical enterprises in economically underdeveloped regions, as well as their supervision and management levels, so as to provide reference for similar areas.
Occupational hazards monitoring and analysis in a coalmine of Henan Province

2014-03-25

In this study, the occupational hazards existing in the production process of a coalmine of Henan Province were detected to prevent occupational disease. The field survey, sampling and analysis were conducted on occupational hazards in a coalmine of Henan Province. The main occupational hazards were noise, coal dust and methane. The detection indicated that workers exposed to dust, noise and methane exceeded the standard limits with the rates of 26.7%, 18.2% and 80% respectively. The indicators of some occupational hazards were high in this coalmine. The authors concluded that it is necessary to improve the working environment, increase the protection degree and control the density and intensity of occupational hazards to prevent occupational disease.

Authors: Meng, Cheng-ming; Qin, Wen-hua; Jiang, Kai-you; Cheng, Guang-chao

Full Source: Zhiye Yu Jiankang 2013, 29(9), 1062-1064 (Ch)

Occupational hazards in workplace of an ethylene plant

2014-03-25

This study investigated the occupational health status of an ethylene unit in an ethylene plant. The focus of occupational health management was identified, and scientific evidence was provided for reducing the occupational hazards in workplace, strengthening the management of occupational health and alleviating occupational hazards exposure. An occupational health survey was performed on a running ethylene plant. The production processes, distribution of occupational hazards, exposure of occupational hazards, occupational protection equipment, use of personal protection equipment and occupational health management, etc were fully understood. The exposed toxicants and noise were detected and evaluated with occupational health examination results. The results showed the concentrations of benzene, toluene, xylene, solvent gasoline and hydrogen sulfide were relatively low, which met the national standard for occupational hygiene. The high noise area concentrated on compressor, large pump of each production unit. Noise was detected on 37 points, among which 20 exceeded the standard of 85 dB (A). Noise intensity was high on separation compressor of old district, and the 8 h average weighted equivalency continuous sound pressure level was 88.0 dB (A). the authors concluded that noise should be taken as a occupational

In this study, the occupational hazards existing in the production process of a coalmine of Henan Province were detected to prevent occupational disease.
This study investigated and analysed the potential occupational hazards in a large washing set of key equipment of a large construction project. Appropriate measures for protection, prevention and control of occupational diseases were recommended. The methods of checklist, analogy and experience were applied for the evaluation. The potential occupational hazards during the production process in this project were metal dust, abrasive dust or silicon dust, welding dust; manganese and inorganic compounds, benzene, toluene, xylene, hydrogen oxidation, propane, carbon monoxide, carbon dioxide, nitrogen dioxide, ozone, hydrogen fluoride, fluoride, sodium hydroxide; noise, heat, hot radiation, UV radiation, arm vibration, bad meteorological conditions and bad lighting. The authors found that there are serious occupational hazards associated with this project, which can be prevented. Therefore, in conclusion the project is feasible from the view of occupational hygiene.

Authors: Chen, Xiao-pei; Zhang, Zhi-gang

Full Source: Zhiye Yu Jiankang 2013, 29(9), 1073-1076 (Ch)

mRNA expression of oncogenes in patients with allergic dermatitis induced by trichloroethylene

The present study investigated mRNA expression of oncogenes (c-fos, c-myc, K-ras, p53) in peripheral blood of patients allergic to trichloroethylene (TCE). Peripheral blood samples were collected from healthy workers (control group) and allergic patients (case group).
This study investigated the death of an elderly patients caused by high-dose atrazine poisoning. Atrazine, 2-chloro-4-(Et amino)-6-(iso-Pr amino)-1,3,5-triazine, belongs to benzotriazole herbicides. It has intensive contaminative ability on the ecological environment with potential teratogenicity and carcinogenicity. The patient disorder was induced by 40% atrazine 2L and resulted in acute respiratory distress syndrome (ARDS) then ineffective treatment and death. The mechanism of atrazine was that it caused membrane lipids peroxidation by participating in oxidation and reduction cycle and generating excess oxyradicals, and resulted in the cellular function disorder and death. The patient was treated with Xuebijing to abate the excess oxyradicals and ulinastatin to inhibit the generation of inflammatory factors such as TNF-α, TNF-β, IL-1α, IL-6, IL-8, IL-10 and TGF-α1.

Authors: Sun, Fang-fang; Han, Dongfeng; Wu, Yan-ping; Liu, Xiao-liang; Sun, Ming-li

Full Source: Zhongguo Laonianxue Zazhi 2012, 32(4), 849-850 (Ch)
Technical

**Neuroendocrine mechanisms of the pathology development in patients who endured an acute intoxication by organophosphorous agents**

*2014-03-25*

This study identified a role of neurohormonal disorders in the development of psychoneurological effects from acute intoxications by organophosphorous agents in 125 workers who had worked at a former facility of neural paralytic weapons (Volgograd Open-Joint-Stock Company-VOAO Khimprom). The functional status of adrenal cortex, thyroid gland and sympathoadrenal system was studied. The results showed the same-type of hormonal disorders in patients both with organic and functional lesions of the nervous system. These findings lead the authors to believe that they are based on a common mechanism of forming responses of the regulating system to changes in the internal medium.

Authors: Filatov, B. N.; Charova, T. A.

Full Source: Toksikologicheski Vestnik 2012, (5), 6-11 (Russ)

**Hormonal contraceptives and arterial disease: An epidemiological update**

*2014-03-25*

The cardiovascular safety of widely used combined hormonal contraceptives is still debated. Newer generations of oral formulations as well as non-oral contraceptives (transdermal and vaginal) have been recently evaluated in the context of cardiovascular disease. This review provides a summary of the association between combined oral contraceptives (COCs) and arterial diseases, with an emphasis on new formulations of hormonal contraceptives, as well as routes of administration. A systematic search of the Medline database was performed to find all relevant articles, which included women who had widely use third generation pills, and the development of new progestins. Eligible articles published in English and reporting risk of arterial events (myocardial infarction [MI] and stroke) among users of hormonal contraceptives were reviewed. A quantitative assessment was made from included studies. Overall, current use of oral combined contraceptives increased the risk of MI and ischemic stroke (pooled OR: 1.7; 95% confidence interval [95% CI]: 1.2-2.3 and OR: 1.8; 95% CI: 1.2-2.8, respectively), but this was not associated with the risk of haemorrhagic stroke (OR: 1.1; 95% CI: 0.7-1.9). The increase in ischemic arterial disease...
was higher among first generation pill users compared with second or third generation pill users. In contrast, risk of ischemic arterial disease among current users of second or third generation pill was similar (p ) 0.23 for MI risk and 0.99 for ischemic stroke). In conclusion, newer generation formulations of COCs, as well as the non-oral hormonal contraceptive, do not seem to be safer than second generation hormonal contraceptives.

Authors: Plu-Bureau, Genevieve; Hugon-Rodin, Justine; Maitrot-Mantelet, Lorraine; Canonico, Marianne

Full Source: Best Practice & Research, Clinical Endocrinology & Metabolism [online computer file] 2013, 27(1), 35-45 (Eng)

SAFETY

High-safety light-weight integrated exhaust device with good firmness for agricultural vehicle

2014-04-08

In the present study, the high-safety light-weight integrated exhaust device with good firmness for agricultural vehicles was discussed. The disclosed integrated exhaust device comprises an exhaust pipe, wherein the exhaust pipe is provided with a plurality of fixing members, the front end of the exhaust pipe is provided with a connecting member, and the rear end of the exhaust pipe is provided with a tail exhaust cover; the exhaust pipe is a hollow stainless steel exhaust pipe and is internally provided with a backpressure-free helical screw, which is coated with a catalyst coating on the surface. The integrated exhaust device has functions of purifying tail gas, saving energy and eliminating noise, has the advantages of simple structure, high safety, beautiful appearance, good high-temperature resistance, good acid and alkali resistance, long service life, light weight and convenient installation and maintenance, and can ensure gas flows to pass through all layers uniformly, greatly increase the effective flow area and reduce exhaust backpressure.

Author: Wang, Liang

Full Source: Faming Zhuanli Shenqing CN 103,266,943 (Cl. F01N13/08), 28 Aug 2013, Appl. 10,237,393, 15 Jun 2013; 5pp. (Ch).
This study describes the development of a ferric bromide demercurizing composite liquid, used to remove mercury from flue gas. The composite liquid uses ferric chloride and calcium bromide as the main active ingredient raw materials, and adds a certain concentration of hydrogen peroxide to compose ferric bromide demercurizing composite liquid, wherein the molar ratio of ferric chloride to calcium bromide is 2 : 3, mass concentration of ferric chloride 1 % - 10 %, the hydrogen peroxide concentration is 0.1 % - 2.0%. The method is characterised in that certain percentage of ferric bromide demercurizing composite liquid is uniformly sprayed into the flue gas; through the iron ions and hydrogen peroxide oxidation of bromide ions generated active bromine atoms or molecules, reuse active bromine atoms or molecules in the flue gas of zero-valent mercury into divalent mercury; finally by wet flue gas desulfurization device and residual divalent mercury bromide absorption of iron complex fluid synchronisation removal, achieve the purpose of the flue gas mercury removal. Compared with the prior art, the invention can improve the flue gas oxidation efficiency of zero-valent mercury, has no secondary pollution, and is cost-effective.

Authors: Qu, Zan; Yan, Naiqiang; Huang, Wenjun; Xie, Jiangkun; Zhao, Songjian

low energy consumption, the powder has a particle size 80 -150 mesh, specific surface area greater than 50m/g, bulk density greater than 0. 8g/cm, non-caking of powder, meets the relevant requirements of standard AQ3015 in a closed wind-free environment, chlorine gas absorption rate is <95% within 3 min, not <99 % within 10min, good settling properties after spraying, its 2 min settlement recovery is not <98 %.

Authors: Zhang, Tong; Wang, Shouzhong; Dong, Chunhong; Han, Li; Li, Zhiying; Wang, Jianfeng