Determination Of Some Heavy Metal Levels In Soft Drinks On

This dissertation, "Analysis of Heavy Metals in Marine Sediments and the Determination of Heavy Metal Profiles in Dated Sediments Cores From Sai Kung Bay, HongKong" by Chi-keung, Lo, ???, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. DOI: 10.5353/th_b3123313 Subjects: Marine sediments - China - Hong Kong Heavy metals - Environmental aspects

Proximate Composition and Heavy Metal Analysis of Farmed Tilapia Fish (Orechromis niloticus) and Their FeedMSH Khan1, M Shahjalal2, S Sultana2, SK Roy3, MA-Ud-Daula2, M Akhter3, L Al31Department of Chemistry, Bangladesh University of Health Sciences (BUHS); 2Department of Applied Nutrition and Food Technology, Islamic University;3Department of Biochemistry and Cell Biology, Bangladesh University of Health Sciences (BUHS).Aims & Objectives: To analyze the proximate composition & some toxic heavy metal analysis of tilapia (Oreochromis niloticus) fish head (with gill) & bodyu2019s edible part (with skin) that are consumed by the Bangladeshi people and

their corresponding feeds. Materials and Methods: Tilapia fishes were collected from selected commercial farms in Mymensingh area, Bangladesh and corresponding feeds were also collected from respective suppliers. The dried and powdered fish parts (head with gill and edible parts of the body including skin) and feed samples were separately analyzed for proximate composition (moisture, crude protein, crude fat, ether extract, ash, nitrogen free extract and acid insoluble ash) and heavy metals (Cd, Cr and Pb). The proximate analysis is quantitative analysis system consists of determinations of the six consecutive steps including water (moisture), total ash, crude protein (CP), crude fat (ether extract), and carbohydrates into two broad classifications: crude fiber and nitrogen free extract (NFE). It was performed according to standard methods. CP by Kjeldhal Method, EE by Shoxlet Apparatus, crude fiber by Fiber Cap System, Ash by Muffle Furnace, Moisture by Oven Dry method, NNE by subtracting CP, EE, CF, Ash & Moisture from 100 and Acid insoluble ash by acid solubilization and then filtration. For heavy metal analysis the samples were digested by microwave digester after ultrasound-assisted acid leaching procedure and the concentration was determined by Flame Atomic Absorption Spectrophotometer (AAS-6800, Shimadzu, Japan). The absorption wavelengths and detections limits for the heavy metals were 217.0 nm and 0.001ppm for Pb, 228.8 nm and 0.002 ppm for Cd and 357.9 nm and 0.05 ppm for Cr. The concentration of the element in question was determined by using a standard curve. The reliability of the procedure for the estimation of all elements was assessed

by internal standard (IS) & analyzing the Certified Reference Material GBW (E) 080684. The actual concentration of each metal was calculated using the formula: actual concentration of metal in sample = (u00b5g/g) R u00d7 dilution factor, Where: (u00b5g/g) R = AAS Reading of digest, Dilution Factor = Volume of digest used u2044 Weight of digested sample. Results: Proximate analysis revealed that all feed contained higher amount (8.96-27.28%) of proteins where three out of four feeds had substantially (28.8-52.20%) lower amount of fat when compared to standard suggested for fish feed. All feeds had higher amount of fiber 3.25 -81.88% except one that had 44% lower than standard. The body and head of Tilapia contained approximately 18.94-19.66% and 15.05-15.69% protein by fresh basis. On the other hand proportion of fat was only 2.45-2.77% in body and 10.38-10.84% in head on fresh basis. The results of heavy metal analysis showed that among the estimated heavy metal concentrations, the highest concentrations were for Cr in one feed sample (735.209 u00b5g/g), and the lowest were for Cd in head sample (0.009u00b5g/g) on dry weight basis. Heavy metals did not exceed the recommended limit in fish sample except Cr in head. Conclusions: It may be concluded that a) Commercially available Tilapia fish feed have only minute amounts of sand/silica b) They are rich in protein (from unknown sources) and fiber but poor in fat contents c) Both body and head of Tilapia in general have high protein content, but again they have less proportion of fat d) Heavy metals contents within tolerable limit in farmed tilapia fish in Bangladesh.

This research explores the potential of specific aquatic plant species to be used as water quality indicators for unhealthy aquatic ecosystem. The success in the economic growth and industrialization in Malaysia has led to environmental problems with ever-increasing land, air, and water pollution. Industrial production without adequate regard for environmental impacts has increased water and air pollution, and has led to soil degradation and large-scale global impacts such as acid rain, global warming, and ozone depletion. These kinds of pollutions led to many environmental impacts to living organism especially in human daily life. Aquatic plants are emergent, submerge, or floating. They are beneficial to aquatic ecosystem because they provide shelter for flora and fauna, produce oxygen, which assists with overall lake functioning, and provide food for fish and wildlife. The absence of aquatic plants may also indicate water quality problems as a result of excessive nutrients, herbicides or heavy metals and may interfere with lake functioning. In this study, ten samples of water were collected from four different places where six different aquatic plant species were abundance and dominant. For the determination of metals in water, samples were treated according to (American Public Health Association, American Water Works Association, Water Environment Federation, 1999) method and analysed by atomic absorption spectrometry for six types of heavy metals which are iron (Fe), lead (Pb), copper (Cu), zinc (Zn), and nickel (Ni) and manganese (Mn). Results showed that the abundance of certain aquatic plant species indicate high concentration of certain heavy metal in that

particular environment. Some of the concentration of heavy metal are exceeded the limits of recommended range INWQS. All were found as good ecological indicators for heavy metal contaminants either at low or high level. Analysis of heavy metals contaminants from four different locations and six different aquatic plant species which are Eichhornia crassipes, Hydrilla verticillata, Cabomba fuscata, Salvinia natans, Nelumbo nucifera and Pistia stratiotes exhibiting highly significant differences (P 0.0001) between aquatic plant species widespread, locations and the heavy metals content. This clearly demonstrates that freshwater environment with abundance of invasive aquatic plant species can have an important influence and indication on the accumulation of heavy metals content. The importance of the interaction components emphasises that the changes in heavy metals composition are complex and the responses are not consistent across all aquatic plant species. Examination of the summarised data revealed that, of the six species analysed at all different locations, all exhibits as potential ecological indicators for unhealthy aquatic ecosystems or as phytoindicator for heavy metal contaminants either at low or high level contamination. The best phytoindicators for excess iron were C. fuscata S. natans> N. nucifera. Meanwhile, magnificent phytoindicators for excess Pb were E.crassipes> S.natans> N.nucifera. In addition, good phytoindicators for zinc were E.crassipes> N.nucifera> S.natans. The best phytoindicator for excess copper were S.natans> C.fuscata> E.crassipes. Meanwhile, magnificent phytoindicators for excess manganese were

E.crassipes> S.natans> N.nucifera. Lastly, good phytoindicators for nickel were E.crassipes> S.natans> N.nucifera. In conclusion, the most reliable phytoindicators for overall experiment were E.crassipes, S.natans and N.nucifera. Therefore, macrophyte is effective in responding heavy metal in low level environmental contamination that might otherwise be difficult to detect.

Although adverse health effects of heavy metals have been known for a long time, exposure to heavy metals continues and is even increasing in some areas. Remediating heavy metal contaminated soils and water is necessary to reduce the associated health and ecological risks, make the land resource available for agricultural production, enhance food security, and scale down land tenure problems. This book discusses the causes and the environmental impact of heavy metal contamination. It then explores many exciting new methods of analysis and decontamination currently studied and applied in the field today.

The determination of heavy metals in plants is very important since human intake of toxic trace elements which even at low doses over a long period of time can lead to malfunction of organs and could cause chronic toxicity. Hence, it is necessary to obtain more information on the plants which grow on soils that contain high concentration of heavy metals in order to determine their potential for management of polluted soils and for metal extraction. The objectives of this research are to determine heavy metal (Cr, Ni, Cu, Mn, Cd, Fe, Pb and Zn) uptake by Ipomoea Aquatica cultivated in closed landfill

and nursery soil and to compare the concentration of heavy metal in both soil samples besides in order to estimate whether a given soil is suitable for cultivation of plants used as food or feed based on World Health Organization - Maximum Level standard. Acid Digestion Method and Wet Destruction Method were used for digestion process of soils and plants. After dilution, the samples will undergo analysis by using atomic absorption spectrometry (AAS). From result that obtained, the concentrations of all heavy were detected in plant and soil but with various concentrations. There are several heavy metals that exceed the maximum level of WHO standard, Cr (4.16 and 6.92 mg kg-1), Cd (4.67 and 3.93 mg kg-1-1) and Pb (9.66 and 8.87 mg kg). As a conclusion, monitoring of heavy metal distribution data in soil and plant samples are very useful for become main references or guidelines in order to monitoring and avoid environmental pollution become worst in terms of quality of soil and also safety level for vegetables to be consumed.

This book presents an exhaustive overview of electrochemical sensors and biosensors for the analysis and monitoring of the most important analytes in the environmental field, in industry, in treatment plants and in environmental research. The chapters give the reader a comprehensive, state-of-the-art picture of the field of electrochemical sensors suitable to environmental analytes, from the theoretical principles of their design to their implementation, realization and application. The first three chapters discuss fundamentals, and the last three chapters cover the main groups of analytes of environmental interest.

In the past two decades there has been an increasing public awareness of the hazards that

exist from the contamination of the environment by toxic substances. 'Heavy metals' and the terrestrial environment are but one facet of the impact of toxic substances on the natural environment, and the use of biological materials for indicating the occurrence of, and continually monitoring the presence of, these materials is a specific topic which is of considerable interest to a diverse range of individuals, organisations and disciplines. It was our intention when we first en visaged this book that it should contain a description of a range of circumstances in which biological monitoring techniques have been employed in the terrestrial environment and that it should be seen as a practical text which dealt with the merits, shortcomings and suitability of biological monitoring materials. Monitoring is, however, a manifold process. It serves not only to provide information on past and present concentrations of toxic materials in various components of the environ ment, but also to provide information on the processes of environmental release, transport, accumulation and toxicity. Indeed, this may be one of the greatest virtues of biological monitoring over other forms of monitor ing. According to the skill of the staff employed in the monitoring procedure, the information that is accrued can have a vastly different value.

A summary of data on heavy metal accumulation, biomonitoring, toxicity and tolerance, metal contamination and pollution in the environment, and the importance of biodiversity for environmental monitoring and cleanup of metal-contaminated and polluted ecosystems. It advocates the use of bacteria, mycorrhizae, freshwater algae, salt marshes, bryo- and pteridophytes, angiosperms, constructed wetlands, reed beds, and floating plant systems and tree crops to treat wastewaters and industrial effluents containing toxic heavy metals.

This title includes a number of Open Access chapters. Although adverse health effects of

heavy metals have been known for a long time, exposure to heavy metals continues and is even increasing in some areas. Remediating heavy metal contaminated soils and water is necessary to reduce the associated health and ecological risks, make the land resource available for agricultural production, enhance food security, and scale down land tenure problems. This book discusses the causes and the environmental impact of heavy metal contamination. It then explores many exciting new methods of analysis and decontamination currently studied and applied in the field today.

Master's Thesis from the year 2018 in the subject Environmental Sciences, grade: 76, language: English, abstract: Rivers are the major sources of water being used in cities and its environs. This water may either be treated or untreated. River banks could be very busy, varied activities ranging from farming to industrial activities and other domestic household activities are conducted. The present study aimed at investigating the potential sources of selected heavy metal contaminants in River Mukurumudzi, Kwale County. Water and sediments were sampled in four points along the river impacted by mining, human settlements and agricultural activities for three different seasons. The samples were analyzed for Iron, Lead, Cadmium, Copper and Arsenic using an AAS. Sediment quality was also analysed by the calculation of CF and I-geo values. Interpretation of results was conducted using Minitab statistical software and Excel spreadsheets. The range of metals in water during the dry season was Fe (0.19-0.32) mg/l, Pb, Cu, Cd and As were below the detection limits. The range of metals in water during the short rain was Fe (0.12-1.25) mg/l and BDL for all other analysed metals. The range of metals in water during the long rain season was Fe (0.07-1.82) mg/l, Cu (0.08-0.11) mg/l and BDL for all the other analysed metals. The range of metals in sediments

during dry season was Fe (0.13-1.44) ppm, Pb (0.08-0.54) ppm, and BDL for all other analysed metals. The range of metals in sediments during short rain season was Fe (0.23-1.73) ppm, Pb (0.12-0.27) ppm, and BDL for all other analysed metals. The range of metals in sediments during the long rain season was Fe (0.25-2.75) ppm, Pb (0.09-0.34) ppm, Cu (0.10-0.14) ppm, and BDL for all other analysed metals. The CF values for sediments were all

In this study, the concentrations of five heavy metals (Pb, Zn, Mn, Cu and Fe) were determined in raw water, sediments and in aquatic macrophytes from selected sites at the Barekese reservoir in Ghana between the periods of June 2011 and January 2012. The obtained results showed that the mean concentration ranges for lead (0.04-0.25 mg/L) and iron (0.49-0.89 mg/L) in the reservoir water exceeded the WHO guideline values of 0.01mg/L and 0.30mg/L respectively for drinking water. The reservoir water was thus concluded as unfit for drinking except after adequate treatment. Comparison of the levels of heavy metals in sediments with the Numerical Sediment Quality Guidelines values showed the sediments as heavily polluted with lead and copper at certain sites of the reservoir. Good information were also provided by analysis of whole plants and organs of passive aquatic macrophytes (Typha domingensis, Ceratophyllum demersum, Pistia stratiotes and Lemna paucicostata). Metals in the plant species were higher in roots than shoots. The mean heavy metal concentrations in all the

water, sediments and macrophytes were observed in the sequence; Fe > Cu > Mn > Pb > Zn.

Heavy metals can be emitted into environment by both natural and anthropogenic sources, mainly mining and industrial activity. Human exposure occurs through all environmental media. Infants are more susceptible to the adverse effects of exposure. Increasing attention is now being paid to the mental development of children exposed to heavy metals. The purpose of this book is to evaluate the existing knowledge on intellectual impairment in children exposed to heavy metals in their living environment and to identify the research needs in order to obtain a clearer picture of the situation in countries and regions at risk, in which the economy is closely related to metallurgy and heavy metals emission, and to recommend a strategy for human protection. In greater detail the main objectives could be formulated as follows: to review the principal sources of single, and complex mixtures of, heavy metal pollutants in the environment; to identify suitable methodology for chemical analyses in the environment and in humans; to evaluate the existing methods for measuring mental impairment, including their reliability and validity; to recommend a standard testing protocol to be used in future research; to assess the future role of environmental heavy metal pollution in countries and regions at risk and its effects on children's neurological

development; to recommend a prevention strategy for protecting children's health and development.

European community had been stated 13 types of heavy metals that have the highest concern. There were including As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sn, and Tl. Some of these heavy metals such as Cu and Ni are actually necessary to our human body but mostly are very dangerous to our health for example Cu can cause cardiovascular disease while can cause cytotoxic role in plant if in excessive amount. This heavy metal pollution in soil is usually occurring in landfill that near the industrial estate. This situation become worst when there is no proper dumping system in that particular area. So, this research will be conducted to determine the presence and distribution of copper and nickel in surface and sub-surface soils around Ulu Tualang Newly-Closed Landfill, Temerloh, Pahang. This research data will become reference for the landfill management and reconstruction. Samples obtained by digging at different point and two samples for each point, one for surface and one for sub-surface soil. The sample heated using oven, pulverized and sieve to get homogeneity. After that the sample digested using SCL (South California Laboratory) method that used HCl and HNO as the digester. After dilution and vacuum filtered the sample analyzed using Atomic Absorption Spectrophotometry (AAS). For the result, after

the sample spiked Cu was detected at 19.2-70.35 mg/kg while Ni was detected around 51.25-99.65 mg/kg. As a conclusion, for the depth differences, the distribution of the heavy metal seems did not have pattern and Ni concentration are higher than copper for both soil layers.

Heavy metals in soils continue to receive increasing attention due to the growing scientific and public awareness of environmental issues and the development of analytical techniques to measure their concentrations accurately. Building on the success and acclaim of the first edition, this book continues to provide an up-to-date, balanced and comprehensive review of the subject in two sections: the first providing an introduction to the metals chemistry, sources and methods used for their analysis; and the second containing chapters dealing with individual elements in detail.

Trace metals occur as natural constituents of the earth's crust, and are ever present constituents of soils, natural waters and living matter. The biological significance of this disparate assemblage of elements has gradually been uncovered during the twentieth century; the resultant picture is one of ever-increasing complexity. Several of these elements have been demonstrated to be essential to the functions of living organisms, others appear to only interact with living matter in a toxic manner, whilst an ever-decreasing number do not fall

conveniently into either category. When the interactions between trace metals and plants are considered, one must take full account of the known chemical properties of each element. Consideration must be given to differences in chemical reactivity, solubility and to interactions with other inorganic and organic molecules. A clear understanding of the basic chemical properties of an element of interest is an essential pre-requisite to any subsequent consideration of its biological significance. Due consideration to basic chemical considerations is a theme which runs through the collection of chapters in both volumes.

This dissertation, "Heavy Metal Analysis in Heaviside's Dolphins (Cephalorhyncus Heavisidii)" by Julie Lynn, Serot, was obtained from The University of Hong Kong (Pokfulam, Hong Kong) and is being sold pursuant to Creative Commons: Attribution 3.0 Hong Kong License. The content of this dissertation has not been altered in any way. We have altered the formatting in order to facilitate the ease of printing and reading of the dissertation. All rights not granted by the above license are retained by the author. Abstract: Skin and blubber tissue samples were collected from two hundred and six freeranging Heaviside's dolphins (Cephalorhyncus heavisidii) during January through June of 2008, 2009, and 2010, along the coast of South Western Africa, to be analyzed for heavy metal concentration levels. Inductively coupled mass spectrometry (ICP-MS) was used to determine sample solution concentrations of all metals

(aluminum, arsenic, cadmium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium and zinc). Data provided by this thesis is the first reference of its kind for this species (Cephalorhyncus heavisidii), which is one of the least-known cetacean species in the world. In addition to baseline heavy metal concentration information for the Heaviside's dolphin, meaningful population structural and ecological information was obtained. A level of site fidelity or specific movement pattern across certain sites was indicated by the presence of different concentration levels across individuals sampled in different areas, especially adjacent areas. With an investigation into the potential sources of the marine heavy metal contamination, it was deduced that these sources contributed to each site's unique and characteristic toxicological and hydrological profile as reflected by the bioaccumulation patterns seen in this study. It was confirmed by this study that bioaccumulation levels are a meaningful and novel measure of population structure. Potential evidence of differences in bioaccumulation patterns between sexes was observed in this study, as well. Although not definitive, a difference in metabolism, heavy metal elimination, or ranging pattern between males and females was suggested by the results. Variation in the results suggests a deepened level of complexity in the physiological and ecological aspects of trace elements accumulation and detoxification in the tissue of an apex predator like the Heaviside's dolphin. Finally, a general assessment of health implications for the species was established, and it was found that Heaviside's dolphins have higher than average

mammalian trace element concentrations, and higher than average concentrations as specifically compared with other odontocetes. Further research using a larger sample size and using internal organs will provide more insight and a deeper understanding of the novel information presented here. DOI: 10.5353/th_b5108687 Subjects: Heavy metals - Environmental aspects - South Africa Dolphins - Effect of water pollution on - South Africa

Human activities have dramatically changed the composition and organisation of soils. Industrial and urban wastes, agricultural application and also mining activities resulted in an increased concentration of heavy metals in soils. How plants and soil microorganisms cope with this situation and the sophisticated techniques developed for survival in contaminated soils is discussed in this volume. The topics presented include: the general role of heavy metals in biological soil systems; the relation of inorganic and organic pollutions; heavy metal, salt tolerance and combined effects with salinity; effects on abuscular mycorrhizal and on saprophytic soil fungi; heavy metal resistance by streptomycetes; trace element determination of environmental samples; the use of microbiological communities as indicators; phytostabilization of lead polluted sites by native plants; effects of soil earthworms on removal of heavy metals and the remediation of heavy metal contaminated tropical land.

Determination of Some Heavy Metal Content of Black Olives Cv GemlikLAP Lambert Academic Publishing

Fish is one of our most valuable sources of protein food. Worldwide, people obtain about 25% of their animal protein from fish and shellfish. Fish, apart of being a good source of digestible protein vitamins, minerals and polyunsaturated fatty acids (PUFA), are also an important source of heavy metals. Some of the metals found in the fish might be essential as they play important role in biological system of the fish as well as in human being, some of them may also be toxic as might cause a serious damage in human health even in trace amount at a certain limit. The common heavy metals that are found in fish include copper, iron, zinc, manganese, mercury, lead and cadmium. The consequence of heavy metal pollution can be hazardous to man through his food. The increasing importance of fish as a source of protein and the interest in understanding the accumulation of heavy metals at the trophic levels of food chain, extend the focus towards fish. Therefore, it is important to monitor heavy metals in aquatic environments (fish, water and sediment). This book, therefore, provides the metal content of Tilapia (Oreochromis niloticus), Nile Perch (Lates niloticus) and Bagrus (Bagrus docmac)

A laboratory investigation of several types of heavy metal-soil solutions was conducted to evaluate the possibility of determining ionic strength and equilibrium concentrations of heavy metals and exchangeable cations by means of the electrical conductivity method. The characteristics of the heavy metal-soil interactions including retention of metals and release of exchangeable cations by the illitic soil were examined, and

electrical conductivity and pH measurements of the heavy metal-soil solutions were performed. Test results revealed that direct determination of equilibrium concentrations of certain ionic species could be realized by means of electrical conductivity measurements of soil suspensions. This laboratory technique is based on determining the relationship between the ionic strengths of the heavy metal-soil solutions and their electrical conductivity in order to derive the necessary correlations to estimate the equilibrium concentrations. The proposed technique is expected to aid in the direct calculation of equilibrium concentrations of metal ions and heavy metals from data collected during site investigation for remedial activity via electric conductivity or soil resistivity techniques.

This volume entitled "Radionuclides and Heavy Metals in Environment" contains the Proceedings of the NATO Advanced Research Workshop (ARW) "Monitoring of Natural and Man-Made Radionuclides and Heavy Metal Waste in Environment" that was held at the Joint Institute for Nuclear Research (JlNR), Dubna, Russia from 3 October to 6 October, 2000. Originally, it was planned to held the ARW in 1999, the year when NATO was celebrating its 50th anniversary. Few days before opening it had to be postponed because of problems in issuing visa for all the colleagues who intended to participate. The ARW was organized and conducted by the co-directors Prof. Vladimir P.

Perelygin, Joint Institute for Nuclear Research, Dubna, Russia and Dr. Peter Vater, Philipps Universitat, Marburg, Germany. The JlNR was chosen as the host institute of ARW because of the lack of contact and real co-operation between the former Soviet Union (FSU) countries specialists in ecology and their Western well experienced colleagues. The selection of this location and supplementary funds provided by Russian Foundation on Basic Research, Moscow, Russia, and the JINR, Dubna., Russia made it possible to attain a rather large number of participants and observers from FSU countries. The JlNR provided to all the participants of the workshop an effective car/minibus transportation Moscow-Dubna-Moscow and a rather good accommodation in Dubna.

This book is mainly focuses on 1. determination of heavy metals 2. comparison of the three digestion methods 3. describes Ethiopian spices 4. explains the advantage of Atomic absorption spectroscopy 5.evaluate the methods in terms of cost, reliability, recovery, rapidity and suitability 6.determine the concentrations of lead, chromium and cadmium in Black cumin, Garlic, Ginger and Fenugreek 7. make comparison between the metal contents in all tested spice samples.

In this book, it was aimed to determine some heavy metal content in black olives cv. Gemlik, which meet an important part of black table olive demand in our country and are of importance in our region. In the research, the iron, copper,

zinc, lead and cadmium content of fresh olives grown at the roadside and on mountains were analyzed and the chemical and metal analyses were carried out on olives harvested from different sites when fresh, in the 1st, 3rd and 5th months of fermentation, or during the marketing period. Moreover, analyses of magnesium, chromium, cobalt, nickel and tin were realized in addition to the metals mentioned, with the aim of determining the metal content of black olives sold in the Bursa market. According to the results obtained from the study, the effects of all three regions on the metal pollution of olives picked from roadsides and near industrial zones were found to be significant statistically.

The immobilization of some heavy metal salts such as CoCl2, CuCl2, NiCl2 and Pb(NO3)2 in various cement matrices is investigated using the solidification/stabilization (s/s) technique. The different cement pastes used in this study were neat Portland cement in absence and presence of water reducing- and water repelling-admixtures as well as blended cements with kaolin and metakaolin. The heavy metals were introduced to the cementitious materials in the form of soluble salts [CoCl2, CuCl2, NiCl2 and Pb(NO3)2] in two ratios (0.5 and 1.0% by weight of the solid binder). Then, the hydration characteristics of the used cement pastes is tested via the determination of the combined water content, phase composition and compressive strength at different time intervals

from 1 up to 180 days.