出國報告 (出國類別:其他)

參加「第30屆含鹵素持久性有機污染物國際研討會(戴奧辛2010)」

服務機關:行政院農委會農業藥物毒物試驗所

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摘要

含鹵素持久性污染物(Persistent Organic Pollutants, POPs)主要是指含氟、氯、 溴等鹵素元素的污染物,包括戴奥辛 (PCDDs, polychlorinated dibenzo-p-dioxins)、呋喃(PCDFs, polychlorinated dibenzofurans)、多氯聯苯(PCBs, polychlorinated biphenyls)、多環芳香烴化合物 (PAHs, polycyclic aromatic hydrocarbons)、溴化阻燃劑類化合物 (BFR, brominated flame retardants)、全氟化 物(PFCs, perfluoroalkyl chemicals)、多氯奈(PCN, polychlorinated naphthalenes) 及有機氣農藥(OCPs, organic chlorinated pesticides)等皆屬於含鹵素持久性污染 物;「含鹵素持久性有機污染物國際研討會」自 1980 年第1 屆會議始已舉辦 29 屆,本年度為第 30 屆含鹵素持久性有機污染物國際研討會(戴奧辛 2010) 「30th International Symposium on Halogenated Persistent Organic Pollutants (Dioxin 2010)」由美國主辦,會議地點為德州聖安東尼奧市 Marriott Rivrcenter(萬豪河畔) 酒店)舉行,研討會議程自9月12日至9月17日,共計6日。本屆研討會 內容包含有關持久性污染物的(1)分析(Analytical) (2)污染源、消退及傳輸、環 境監測(Sources, Fate and Transport, Environmental Monitoring) (3) 人體暴露 (Human Exposure) (4) 毒理學與健康(Toxicology/Health) (5) 風險、控管及清除 (Risk, Regulations, and Clean up)等五大主題上之研究,共計發表 626 篇論文。

會議主題中對於禽、畜、水產品中 POPs (以 PCDDs/DFs、PCBs、PBDEs 為 主要)含量分析調查以及經由取食過程人體所攝入的 POPs 量仍為各國持續關注 之議題,包括美國、日本、韓國、比利時、愛爾蘭、法國、丹麥、土耳其、中國 及西班牙等國皆有相關研究資料發表。此外,本次會議主題之一「Contaminated Sites: cases, remediation, risk and policy」所發之文章,主要為各國針對其國內所 發生的 POPs 污染事件的原因、調查結果、風險評估及管理等提出討論,並提供 其他國家參考。

本所徐慈鴻等研究人員於此次研討會中發表論文一篇「Determination of PCDDs/DFs/DL-PCBs in duck egg, salted duck egg and century egg samples by the DR CALUX® bioassay」,並於會議期間以壁報展示論文內容以進行學術交流,增加相關研究領域之專業知識並增進國際交流。

關鍵詞:持久性有機污染物、戴奧辛、呋喃、多氯聯苯、多環芳香烴化合物、 溴化阻燃劑類化合物、全氟化物、多氯奈。

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依農委會指派本所分別成立戴奧辛生物快速篩檢實驗室及化學分析實驗室,以協助監測及調查我國農、禽、畜及水產品中的戴奧辛類化合物含量,維護農水畜產品的食用安全;本次奉派參加「第30屆含鹵素持久性有機污染物國際研討會(戴奧辛 2010)」之目的是希望透過持久性有機污染物(POPs)研究的年度重要國際會議,瞭解國際間持久性有機污染物研究之最新情況,包括 POPs 的檢測分析技術、各國相關法規及允許限值的訂定、人體暴露狀況、生態環境及毒理研究、污染事件的評估探討等;並將本所之研究成果透過論文及壁報展示,與其他國家相關領域之研究人員進行學術交流,建立聯絡管道,提升本會(農委會)以及本所之研究水準及國際能見度;此外,在研討會中也可瞭解其他國家面臨農水畜產品戴奧辛污染事件時的危機處理經驗及後續補救措施,可為我國之借鏡及參考。

二、過程

第 30 屆「國際鹵化持久性有機汙染物-戴奧辛研討會」,於美國德州聖安東 尼奧市萬豪河畔酒店(Marriott Rivercenter,圖一)舉行,研討會議程自 9 月 12 日 至 9 月 17 日,共計6日。



圖一、會議開幕、會議主席 Dr. Laurie Haws 開幕致詞、開幕式後的舞蹈表 演及會議所在地點- Marriott Rivercenter

本屆會議近七百多位專家學者與會,計發表論文 626 篇(口頭宣讀論文 260 篇及壁報展示論文 366 篇),會議發表文章將收錄於本屆 2010 Organohalogen Compounds。

研討會論文發表包括口頭論文宣讀及壁報論文展示,論文宣讀分別於5個會 議廳同時進行,以 Power Point 簡報軟體進行15分鐘簡報後,接受5分鐘提問; 壁報論文展示期間為13日至16日下午,作者依大會安排分別於13日、14日或 16 日三個時段,必須於展示會場接受提問討論。壁報展示會場的內另有儀器展示會場,本次參展的廠商計 26 家,包括有提供 POPs 標準品供應、POPs 參考物質供應、分析儀器、前處理裝置、分析技術提供等廠商及公司,美國 National Institute of Standards and Technology(NIST)的化學分析部門在本次會議中發表該單位所能提供的最新標準參考物質種類。

研討會於9月11-12日接受報到及註冊;而9月13至16日是論文展示及演 講發表時間,會議議程如(附件一);會議於9月17日中午結束,明年(2011年) 的研討會會議預計於8月21-25日於比利時布魯塞爾舉行。

三、心得

本次研討會主題探討含鹵素持久性有機污染物的分析(Analytical)、污染 源、消退及傳輸、環境監測(Sources, Fate and Transport, Environmental Monitoring) 、 人 體 暴 露 (Human Exposure) 、 毒 理 學 與 健 康 (Toxicology/Health) 和風險、控管及清除(Risk, Regulations, and Clean up)等 五大主題,各主題下另細分 3-8 項子題;除上述五項主題外,主辦委員會議 另規劃一特定主題(Special session topics)針對涵蓋 12 項子題。本次會議主題 以「污染源、消退及傳輸、環境監測」所發表的論文篇數最多,約計 200 篇; 其次爲「人體暴露」主題計發表 115 篇;以子題區分則以探討「Human Exposure to Dioxins and PCBs」的論文 55 篇爲最多,其次爲探討「Advances in analytic, screening and confirmatory methods」的論文計 51 篇。

我國研究人員於此次會議計發表 10 篇研究論文,本所研究團隊發表之 論文見(附件二)。在眾多的議題中有幾項重點與本所研究及業務有較直接 之關連,茲將相關議題之心得分述如下:

污染事件的調查、回復及評估

此議題主要為各國針對其國內所發生的 POPs 污染事件的原因、調查結果、 風險評估及管理等提出討論並提供其他國家參考。2008 年義大利南部 Apulia 區,接近 Taranto 港口的一大型工業區周邊牧場的 4 個羊奶樣品及 1 個起司樣品 的戴奧辛含量被發現超過歐盟訂定的限值,因此政府單位展開調查計畫,分別針 對距離工業區 5、10 及 15 公里的奶品、雞蛋、動物組織、飼料樣品、放牧地或 生產芻料區域的土壤及作為動物飲水源的地下水等樣品進行採樣及監控分析;第 1 年的食品及飼料分析結果顯示飼料樣品的戴奧辛及 PCB 的毒性當量値 (PCDDs/DFs/sl-PCBs)雖然高於一般背景值,但都符合歐盟規範(1.5 ng WHO-TEQ /Kg);包括動物肝臟組織、脂肪組織、奶品及肌肉組織等食品則有 30 個樣品超過限值,在羊肝樣品測得最高值達 279.2 pg WHO-TEQ/g fat;第 2 年分 析土壤及地下水樣品,結果顯示共有 3 處土壤樣品及 1 處地下水樣品超過義大利 的國家標準,此事件的樣品仍持續分析調查,而地方政府已經禁止在接近工業區 周邊 20 公里範圍內進行放牧及消費該區域的動物源食品;但追蹤污染源並釐清 戴奧辛如何經由食物鏈造成污染,以及此污染事件可能引起的流行病學之相關調 查是迫切的工作。

除此事件外,2009年在義大利中部 Umbriaf 區,Vascigliano 工業區的廢棄 物堆置場發生大火持續延燒 1 週,由於該堆置場堆放包括工業及農業活動的廢棄 物、事故車輛的塑膠廢棄物,因此該火災所產生的粒狀物沈降是否影響周邊區域 的農、禽、畜產品及芻料受到關注,Esposito et al.等研究人員針對火災現場附近 的禽畜場、牧草地進行奶、雞蛋、動物組織、蔬菜、乾草(hay)及牧草(grass)採集 共 85 個樣品進行戴奧辛類化合物(PCDDs/DFs/sl-PCBs)分析,27 個蔬菜分析結果 皆低於歐盟建議値,但有 17 個動物源食品(共分析40 個樣品)及 9 個飼料樣品(共 18 個樣品)超過限値:由於超過限値的樣品數比例偏高,地方政府除馬上禁止此 區域動物及芻料的流通外,陸續於災後 4 個月及 8 個月後於火災現場周邊 3 公里 區域範圍內的禽畜場及牧草地進行再次採樣及分析,結果顯示災後 4 個月的牧草 芻料樣品已完全符合歐盟建議值,包括牛羊動物的蛋及奶品也符合限値可以上 市,但仍有部分肉品仍超過限值需持續追蹤分析。

德國學者 Weberet al.則針對該國 Düsseldorf-Gerresheim 區在 2001 年因為用 來製造飲料瓶的塑膠板箱(plastic crates)堆置存放場發生火災,在救災過程使用的 滅火泡沫劑含有 perfluoroalkyl compounds (PFCs) (包括 perfluorooctane sulfonate (PFOS)),導致大量的 PFCs 化合物因此事件污染該區的地下水,並於多年後(2007) 污染引灌地下水之農田,最後發現該區飲用水也遭到 PFCs 的污染,在 2009-2010 調查該區的地下水、土壤及蔬果樣品的 PFCs 及 PFOS 含量,發現被污染的地下 水樣品可測得多種的 PFCs 化合物,包括 PFOS、 PFHxS、 PFBS、 PFBA、 PFPA、 PFHxA, PFHpA、 PFOA 及 PFNoA,最高測值含量達 89000 ng/l;而土壤表土測 得 PFOS 含量最高達 18 µg/kg (100% PFOS);芹菜及蘋果的含量達 32µg/kg (主要 有 PFOS、 PFHxS 和 PFDoA);根據德國政府針對 PFOS 所訂定的 PFOS 及 PFOA 的 TDI 值為 0.1µg/kg body weight/day,則該區多數的蔬果必須被銷毀,雖然目 前對於使用被污染的地下水對人體健康的影響仍不明確,但應避免持續的使用; 而對於此污染事件後續的復育方法仍無明確策略。

丹麥政府針對食品及飼料中戴奧辛及多氯聯苯的持續調查計畫中發現豬

油、牛油及雞蛋等 3 個食物樣品的戴奧辛及多氯聯苯含量超過歐盟的行動值 (action level)或最大值(maximum),經過農民訪談及包括飼料、芻料及飼養區土壤 的分析,探究污染源所在原因並輔導農友注意相關的飼養過程,發現對於農友以 放牧方式飼養牛隻及雞隻時,須注意動物經由吃食過程連帶攝入的土壤會是禽畜 體內戴奧辛類化合物累積之來源。

荷蘭學者Traag et al.報導該國蛋雞的飼料含有自烏克蘭進口戴奧辛污染的有機玉米,導致有機雞蛋中的戴奧辛含量偏高,而在此事件中延伸出去思考對於目前歐盟設定飼料中戴奧辛含量限值是否對蛋雞而言不夠嚴謹,以符合目前戴奧辛限值的飼料餵食蛋雞,並不能保證雞蛋的戴奧辛含量低於最大限值的規範;而目前的規範對於飼料中 dl-PCBs 的含量檢測並未嚴格要求,因此飼料及玉米的生產者並不會主動去檢測或注意飼料中的類戴奧辛多氯聯苯化合物含量。

希臘研究單位則針對森林大火後,對災區周邊不同距離的橄欖生產區及橄欖 油中的戴奧辛、類戴奧辛多氯聯苯及多環芳香烴(PAHs)進行分析,結果顯示皆未 有偏高的情形。

我國成大在研討會提出報告係利用 ELISA 篩檢台南安順區受戴奧辛污染土 壤的範圍與其他國家交流。

會議中經由聽取吸收各國政府單位對持久性有機污染物意外事件的始末、事件發生後對環境介質及農、禽、畜、水產品中持久性有機污染物的監測追蹤、事件發生過後的檢討及控管策略可作為我國的參考經驗。

室內灰塵(dust)中的持久性污染物監測

包括住家、學校、工作場所甚至汽車內等各種室內灰塵(dusts)中的持久性有機污染物濃度的監測可作為一個流行病學研究上的長期暴露指標,在本次會議中包括美、英、歐洲及日本學者皆針對室內灰塵中的持久性污染物的檢測提出相關研究資料。

Whitehead et al.等學者自 2001-2007 收集加州中部及北部家庭室內的灰塵,並分 析灰塵中的 22 種 PBDE 化合物、15 種 PCB 化合物、2 種 pesticides(4,4'-DDT 及 4,4'-DDE)及 12 種 PAHs 的含量,分析結果顯示室內灰塵持久性污染物的含量以 PBDEs>PAHs>PCBs,PBDE 類化合物的平均含量以 BDE-47、BDE-153 及 BDE-209 含量較高,部分樣品的 BDE-209 呈現異常偏高的情形(最高測值達 72,133 ng/g); PAH 類 化 合 物 平 均 含 量 則 以 phenanthrene(519ng/g)> fluoranthene(290ng/g)>pyrene(256ng/g)>chrysene(157ng/g)> benzo(*g*,*h*,*i*)perylene(146ng/g) 等 5 種 化 合 物 含 量 較高; PCB 類 化 合 物 环 均 含 量 則 以 CB-138(6.34 ng/g)>CB-101>CB-153>CB-118>CB-180>CB-52(3.26 ng/g)等 6 種化合物含量較 高; 至於 4,4'-DDT 及 4,4'-DDE 的含量分別為 42.3ng/g 及 18.4ng/g。

美國 National Institute of Standards and Technology(NIST)的化學分析部門在本次 會議中發表該單位所能提供的最新標準參考物質種類,包括多種粒狀物的標準參 考物質,其中之一為 urban dust(No.1649b),這些粒狀物及灰塵的標準參考物質包 括有 PAHs、PBDEs、PCBs 及 organochlorine 的分析結果。

挪威 Haug 等學者則分析奧斯陸 41 個女性血清(serum)樣本及其住家灰塵樣本中的 PFCs 含量,發現血清中主要的 PFCs 包括 PFHxS、PFOS、PFOA、PFNA、PFDA及 PFUnDA等,分析結果的 median 濃度分別為 0.39、6.7、1.4、0.63、0.23及 0.42 ng/ml;而灰塵中的 PFCs 包括 PFHxS、PFOS、PFDS、PFHxA、PFOA、PFNA、 PFDoDA及 PFTrDA等,其中 PFOS及 PFOA的 median 濃度分別為 3.1及 18 ng/g dust,利用多重直線迴歸分析後,顯示灰塵樣本和血清樣本中的 PFOA、PFHxS及 PFOS含量有顯著相關性。

捷克 Stavelova 等學者則進行一項相當引人注意的研究; 收集該國市售的 Skoda、

Honda、Peugeot、Ford、Subaru、Volkswagen、Mercedes、Mazda、Nisan、Renault 等車廠不同年份出廠的 27 種型號車款的車內灰塵(car dust),進行 PBDEs、HBCD 及 non-PBDEs 等阻燃劑的含量分析,分析結果顯示車內灰塵的阻燃劑成分總和 最高可達 33897µg/kg,最低則小於 20µg/kg,所有樣品的阻燃劑成分皆以 BDE209 含量最高,佔總量約 85%。

日本 Ehime University 的學者與越南學者共同探討在越南國內電器及電子廢棄物 (E-waste)回收場附近的住家灰塵(house dust)所含的戴奧辛相關化合物的含量 (dioxin-related compounds),所收集的灰塵樣品利用 DR CALUX 進行生物分析, 並根據 DR CALUX 分析結果針對部分樣品進一步以 HRGS-MS 分析:DR CALUX 分析顯示 E-waste 回收場附近住家灰塵樣本的戴奧辛類化合物含量(median concentration 490 及 520 pg CALUX-TEQ/g)顯著較當地對照組(urban control site) 樣本(median concentration 140 pg CALUX-TEQ/g)高,也比日本住家及辦公室內灰 塵的含量高,經 HRGS-MS 分析顯示,E-waste 回收場附近住家灰塵樣本的以 PCDFs、PBDFs、MBPCDFs、non-ortho PCBs 及 PBDDs 含量明顯較對照組的灰 塵樣本高,其中又以 PBDFs 含量最高達數十 ng/g,而 PBDF 的來源為 PBDE 經 熱作用(mild thermal stress)或者光分解作用(photolysis)後轉變而成;PCDFs 為次 含量高者,PCBs 化合物則以 CB-77 含量較高。

CALUX 生物篩檢法應用於食品及飼料中持久性有機污染物的監測

在本次會議中,關於 CALUX 生物快速篩檢法應用的相關發表有 25 篇論文, 包括應用於土壤、底泥、黏土、住家灰塵、貽貝(河蚌)、鷹蛋、食品、飼料及飼 料添加物等基質的戴奧辛含量篩檢,智利及荷蘭研究人員應用 CALUX 方法於飼 料添加物及飼料進出國時樣品的快速監測篩檢,而波蘭研究單位則應用 CALUX 方法篩檢飼料及各類飼料添加物戴奧辛類化合物,在所檢測的 887 件樣品中,僞 陽性樣品數約佔總檢測樣品數目的 7%,無僞陰性樣品。

日本 Ehime 大學研究人員利用 DR CALUX 檢測來自 Cambodia、China、Hong Kong、India、Indonesia、Japan、Korea、Malaysia、Philippines 及 Vietnam 等國

海岸水域的貽貝類(mussels)中戴奧辛類化合物的含量,並利用 HRGC-MS 進行確認,發現在這些貽貝類樣品中的 PBDDs 及 PBDFs(多溴戴奧辛及呋喃)含量會使 DR CALUX 的檢測值偏高,而這些多溴戴奧辛及呋喃類化合物中以 TriBDDs 化 合物對 DR CALUX 活性的影響最顯著。

土耳其農部研究單位與荷蘭 Wageningen 大學針對對土耳其出口到歐洲的重要魚類產品包括鰻魚、鯖魚、比目魚及藍魚的 PCDD/Fs、PBDD/Fs、PBDEs、PAHs、PCBs、有機氯農藥及重金屬含量進行監測,並針對 PCDD/Fs 及 dl-PCBs的含量同時比較 HRGC-MS 及 CALUX 的分析結果,顯示二種方法的分析結果相當一致。

由於 CALUX 方法為歐盟法令所允許應用於食品及飼料樣品中戴奧辛類化 合物含量的篩檢方法,如何設定 CALUX 檢測結果的最適 cut-off value 以降低係 陽性及偽陰性樣品的比例是本次會議中討論的議題之一,適當的 cut-off value 可 以有效的監測並減少分析成本。

藥毒所(本所)戴奧辛生物快速篩檢實驗室在本次研討會中發表論文 「Determination of PCDDs/DFs/DL-PCBs in duck egg, salted duck egg and century egg samples by the DR CALUX[®] bioassay」,針對我國特殊的鴨蛋加工產品-鹹鴨蛋 及皮蛋建立 DR CALUX[®]生物快速篩檢法流程,結果顯示經由淨化流程的修正, DR CALUX[®]可以穩定的應用於鹹鴨蛋的戴奧辛含量快速篩檢,但是對於皮蛋的 篩檢仍需持續改進淨化流程,去除干擾物質後才能應用。針對市售 8 個鴨蛋樣品 及 16 個鹹鴨蛋樣品進行戴奧辛及類戴奧辛多氯聯苯的篩檢,結果顯示樣品的戴 奧辛及類多氯聯苯的含量都低於歐盟限值(附件 2)。

持久性有機污染物的攝入量評估

包括韓國、中國、法國及美國在本次會議中針對本國國民經由食物所攝取的 PBDEs 類化合物的攝取進行攝入量評估(dietary intake),而英國則針對食物中的 溴化、含鹵素戴奧辛及呋喃(brominated and mixed halogenated dioxins and furans),包括 PBDDs、PBDFs、PBrCIDD/DFs 的含量進行分析,並評估其在某 些食物中對整體戴奧辛類化合物毒性的貢獻度。日本則發表其食物中戴奧辛攝取 量之調查及國民體內中戴奧辛累積量的調查分析結果,日本政府並將相關調查結 果節印成冊「The accumulation of dioxins in the Japanese People」並於會議現場供 各界取參,相關調查資料也可由網路下載完整版本。



圖二、壁報論文展示及與相關研究人員之交流情形。

四、建議事項

- 我國尚未訂定飼料及飼料添加物中的戴奧辛類化合物和類戴奧辛多氯聯苯的 含量限值,本會(農委會)可考慮積極進行標準的訂定,更能確保禽、畜、水 產品的安全品質及食用安全。
- 本會目前已積極針對有污染疑慮地點周邊的禽、畜、水產品的戴奧辛含量進 行監測,未來可考慮增加例行性禽畜水產品的篩檢監測,以掌握各類產品的 戴奧辛類化合物之背景含量並加強產品安全性之控管。
- 3. 本所將積極參考相關研究針對不同基質建立 DR CALUX[®]生物篩檢法的最適 cut off value,以更有效的監測各類樣品並減少樣品分析成本。
- 參加國際研討會除可增加相關研究領域之專業知識,並可與國際同領域之研 究人員互動,獲益頗多,應多鼓勵研究人員參加國際研討會,增加與國際間 之互動及聯絡管道。
- 此次初訪英語系國家,舉凡食、衣、住、行皆需使用英文對話,對於英語聽 說能力的提升有直接效果。

伍、參考文獻

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- 17. The accumulation of dioxins in the Japan people. 2009 Environmental Risk Assessment Office Environmental Health Department Ministry of the Environment, Japan.



附件一

Advances in Analytical, Screening and Confirmatory methods

- 9:45 1194 PLE FOR EXTRACTION OF DIOXINS IN ANIMAL FEED AND INGREDIENTS Jean-Fran ois Focant
- 10:05 1061 MULTI-RESIDUE METHOD FOR PESTICIDES AND POPS IN MILK AND CREAM USING COMPREHENSIVE TWO DIMENSIONAL GAS CHROMATOGRAPHY TIME-OF-FLIGHT MASS SPECTROMETRY Douglas Hayward
- 10:25 1424 NON-TARGET GC/EI-MS SCREENING OF POLYHALOGENATED COMPOUNDS Natalie Rosenfelder
- 10:45 1256 REVISED EU-CRITERIA FOR APPLYING BIOANALYTICAL METHODS FOR SCREENING OF FEED AND FOOD FOR DIOXINS AND DIOXIN-LIKE PCBS Ron Hoogenboom
- 11:05 1383 NEW CUT-OFF VALUES FOR APPLICATIONS IN BIOANALYTICAL SCREENING: DECISION OVER SAMPLE COMPLIANCE WITH LEGAL LIMITS SET BY THE EUROPEAN UNION FOR PCDD/ FS AND DIOXIN-LIKE PCBS Johannes Haedrich
- 11:25 1262 APPLICATION OF THE XDS-CALUX BIOASSAY IN ROUTINE: SEMI-QUANTITATIVE SCREENING USING AL-BEQ CUT-OFF VALUES Huig Vanderperren
- 11:45 1365 DISCREPANCIES BETWEEN BIO-ANALYTICAL AND CHEMO-ANALYTICAL RESULTS HAVE A NON-NEGLIGIBLE MESSAGE Leo Goeyens

Advances in the Toxicology of Dioxins and POPs

- 9:45 1028 PKC SIGNALING PATHWAY MODULATES TCDD-INDUCED APOPTOSIS OF ARTICULAR CHONDROCYTES Jae-Ho Yang
- 10:05 1102 CO-EXPOSURE TO METHYLMERCURY AND PCBS INCREASES ACCUMULATION OF PCBS IN THE BRAINS OF OFFSPRING MICE Miyuki Shimada
- 10:25 1545 GENOMIC ANALYSIS OF HUMAN KERATINOCYTES IDENTIFIES BROAD EFFECTS OF DIOXIN ON GENES REQUIRED FOR EPIDERMAL BARRIER FORMATION Thomas Sutter
- 10:45 1395 CYP1A1 INDUCTION IN LYMPHOCYTES FROM MICE AND HUMANS: A BIOMARKER OF DIOXIN EXPOSURE? Majorie van Duursen
- 11:05 1400 TCDD INDUCES BIOMARKERS FOR ENDOMETRIOSIS IN RAT ENDOMETRIUM AND HUMAN ECC-1 CELLS Karin van Ede
- 11:25 1042 INHIBITORY MECHANISMS OF TYROSINE KINASE INHIBITORS, HERBIMYCIN A, AND TYRPHOSTIN COMPOUNDS ON THE FUNCTION OF ARYL HYDROCARBON RECEPTOR IN CACO-2 CELLS Shuya Kasai
- 11:45 1465 NON-ADDITIVE EFFECTS OF PCB153 AND TCDD ON HEPATOTOXICITY IN C57BL/6 MICE Tim Zacharewski

Dioxins and Related Compounds in Diet: Evaluation, Trends, and Risks

- 9:45 1526 RISK ASSESSMENT: THE SCIENCE THAT UNDERPINS THE REGULATIONS Natalie Thatcher
- 10:05 1190 PCDD/FS AND DL-PCBS IN FOOD SAMPLED IN BADEN-W RTTEMBERG BETWEEN 1993 AND 2009 - INFLUENCE OF WHO-TEFS2005, COMPARISON WITH PROPOSED LEGAL LIMITS AND TIME TREND Kerstin Wahl
- 10:25 1063 NEW AND OLD POPS (PCDD/ FS, PCBS, AND PBDES) IN U.S. FOODS: LEVELS, TRENDS, AND IMPLICATIONS FOR HUMAN EXPOSURE Janice Huwe
- 10:45 1136 AN UPDATE TO ESTIMATES OF INTAKE OF DIOXIN-LIKE COMPOUNDS FOR THE GENERAL POPULATION OF THE UNITED STATES Matthew Lorber
- 11:05 1602 MIXED HALOGENATED DIOXINS AND BIPHENYLS IN UK FOOD David Mortimer
- 11:25 1413 POLYCHLORINATED NAPHTHALENES (PCNS) IN IRISH FOODS: OCCURRENCE AND DIETARY EXPOSURE Christina Tlustos
- 11:45 1476 FAST FOOD CONSUMPTION AND OTHER DIETARY MEASURES PREDICT PFC SERUM CONCENTRATIONS IN THE U.S. POPULATION Thomas Webster

Human Exposure to Fluorinated Compounds

9:45 1126 — A TEMPORAL TREND STUDY (1972-2008) OF PERFLUOROOCTANESULFONATE, PERFLUOROHEXANESULFONATE, AND PERFLUOROOCTANOATE IN POOLED HUMAN MILK SAMPLES FROM STOCKHOLM, SWEDEN Maria Sundstrom

10:05 1019 — ANALYSIS, OCCURRENCE AND RISK OF PERFLUORINATED COMPOUNDS IN BREAST MILK AND COMMERCIAL Dami Barcel

10:25 1127 — DO PERFLUORINATED COMPOUNDS IN DUST FROM NORWEGIAN HOUSES AFFECT THE SERUM LEVELS OF THEIR RESIDENTS? Line Sm stuen Haug

10:45 1179 — PFCS IN INDOOR OFFICE AIR: CONCENTRATIONS AND CONTRIBUTION TO EXPOSURE Alicia Fraser

11:05 1553 — ABNORMALLY HIGH SERUM LEVELS OF PERFLUOROHEXANE SULFONATE(PFHXS) IN A CANADIAN FAMILY - A CASE STUDY. Sanjay Beesoon

- 11:25 1390 HUMAN EXPOSURE TO FLUORINATED SKI WAX Helena Nilsson
- 11:45 1317 COMPARISON OF PFOS AND PFOA SERUM CONCENTRATIONS IN PEOPLE UNDERGOING REGULAR VENESECTIONS AND IN THE BROADER COMMUNITY Jack ThompsonAfternoon Session

Human Exposure to Fluorinated Compounds

- 9:45 1308 EMISSION FACTORS FOR PCDD/PCDF FROM FOREST AND CROP FIRES - REVISION OF CATEGORY 6A OF THE UNEP TOOLKIT Jochen Mueller
- 10:05 1117 FORMATION AND DEGRADATION OF DIOXINS IN AN INCINERATION PROCESS, AND THE ROLE OF SURROGATE COMPOUND MONITORING Katsuya Kawamoto
- 10:25 1185 DIOXIN AND FURAN IN WASTE INCINERATIONS AND THERMAL PROCESSES Neeta Thacker
- 10:45 1143 EMISSION OF PCDD/FS AND DL-PCBS FROM PIDGEON PROCESS OF MAGNESIUM SMELTING Zhiqiang Nie
- 11:05 1574 PCDD/F, PCB AND HCB EMISSIONS FROM BRICK MAKING IN DEVELOPING COUNTRIES - A CASE STUDY FROM MEXICO Pablo Maiz
- 11:25 1110 DIOXIN IN VIETNAM Le Thi hai Le
- 11:45 1123 SOURCES OF HIGH 6-HYDROXY BDE-47 LEVELS IN CALIFORNIA CATS: METABOLISM OR DIET? June-Soo Park



Brominated Compounds — Fate and Transport

- 14:00 1438 ATMOSPHERIC DEPOSITION AND BIOACCUMULATION OF SELECTED HALOGENATED ORGANICS IN REMOTE LAKES AND IN THE GREAT LAKES Derek Muir
- 14:20 1438 FATE OF PBDES IN LAKE TROUT ACROSS CANADA Sarah Gewurtz
- 14:40 1145 TEMPORAL TRENDS OF HEXABROMOCYCLODODECANES IN URBAN, RURAL, AND REMOTE LAKES IN SWITZERLAND Christian Boadal
- 15:00 1067—CONTAMINATION STATUS OF POLYCHLORINATED BIPHENYLS AND POLYBROMINATED DIPHENYL ETHERS IN FISH AND SHELLFISH COLLECTED FROM COASTAL WATERS OF SURABAYA CITY, INDONESIA Muhammad IIyas
- 15:50 1217 BIOACCUMULATION OF POLYBROMINATED DIPHENYL ETHERS (PBDES) AND SEVERAL NON-PBDE FRS IN WATERBIRDS FROM AN E-WASTE RECYCLING REGION IN SOUTH CHINA Xiao-Jun Luo
- 16:10 1149 SPECIES-SPECIFIC DIFFERENCES AND STRUCTURE-ACTIVITY RELATIONSHIPS IN THE DEBROMINATION OF PBDE CONGENERS AMONG THREE FISH SPECIES Simon Roberts
- 16:30 1113 HBCD ISOMERS: DEGRADATION RATES AND HYDROXYLATED PRODUCTS FROM MICROSOME INCUBATION EXPERIMENTS Roland Becker
- 16:50 1041 INFLUENCE OF CHEMICAL DEGRADATION KINETIC PARAMETERS ON THE TOTAL DEBROMINATION OF PBDES IN A LANDFILL SYSTEM Monica Danon-Schaffer

Dechlorane Plus: A Recently Discovered, High Production Volume Flame Retardant

- 14:00 1177 DECHLORANE PLUS IN GREAT LAKES AIR Ronald A. Hites
- 14:20 1352 DECHLORANE PLUS AND RELATED COMPOUNDS IN SPANISH AIR Adri n de la Torre
- 14:40 1268 LARGE-SCALE DISTRIBUTION AND TRANSPORT OF DECHLORANE PLUS IN AIR AND SEAWATER OF THE NORTHERN AND SOUTHERN ATLANTIC OCEAN Axel M ller
- 15:00 1523 ISOMERS OF DECHLORANE PLUS IN THE EGGS OF FOUR SPECIES OF GULLS (LARIDS) FROM COLONIES ACROSS CANADA AND THE INFLUENCE OF DIET ON SPATIAL DISTRIBUTION Robert Letcher
- 15:50 1354 DECHLORANE PLUS AND POSSIBLE ENVIRONMENTAL METABOLITES IN WHITE STORK EGGS Juan Mu oz-Arnanz
- 16:10 1489 TEMPORAL TRENDS OF DECHLORANE 602, 603 AND 604 IN NIAGARA RIVER SUSPENDED SEDIMENT AND LAKE ONTARIO LAKE TROUT Li Shen
- 16:30 1286 LEVELS AND ISOMER PROFILES OF DECHLORANE PLUS IN SURFACE SOILS FROM E-WASTE RECYCLING AREAS AND INDUSTRIAL AREAS IN SOUTH CHINA Zhigiang Yu
- 16:50 1484 OCCURRENCE OF DECHLORANE IN A WASTEWATER TREATMENT PLANT OF Hong Qi

Disease Risk and TCDD Exposure Estimated from Serum Evaluations

- 14:00 1276 THE RANCH HAND STUDY: LESSONS LEARNED Joel Michalek
- 14:20 1138 MORTALITY RATES AMONG WOKERS EXPOSED TO 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN AT A TRICHLOROPHENOL PLANT IN NEW ZEALAND David McBride
- 14:40 1660 PLASMA DIOXIN LEVELS AND CAUSE-SPECIFIC MORTALITY IN AN OCCUPATIONAL COHORT OF WORKERS EXPOSED TO CHLOROPHENOXY HERBICIDES, CHLOROPHENOLS AND CONTAMINANTS Daisy Boers
- 15:00 1059 MODELLING OF HISTORICAL 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN EXPOSURE IN A COHORT OF WORKERS EXPOSED TO CHLOROPHENOXY HERBICIDES, CHLOROPHENOLS AND CONTAMINANTS Roel Vermeulen
- 15:50 1147 DEATH RATES FOR TRICHLOROPHENOL AND PENTACHLOROPHENOL WORKERS WITH DIOXIN EXPOSURES IN MIDLAND, MICHIGAN James Collins
- 16:10 1146 CANCER INCIDENCE AND MORTALITY IN THE POPULATION EXPOSED TO DIOXIN AFTER THE "SEVESO", ITALY, ACCIDENT Angela Cecilia Pesatori
- 16:30 1214 DIOXINS AND PCBS AMONG RUSSIAN BOYS: PREDICTORS OF SERUM LEVELS AND ASSOCIATIONS WITH CHILDHOOD GROWTH Jane Burns
- 16:50 1036 SERUM DIOXIN CONCENTRATIONS AND BREAST CANCER RISK IN THE SEVESO WOMEN S HEALTH STUDY Marcella Warner

Environmental Exposure to PCBs — Anniston Community Health Survey (ACHS)/PCBs and Other POPs in Schools and the Workplace

- 14:00 1449 SPATIAL DISTRIBUTION AND DETERMINANTS OF PCB CONTAMINATION IN RESIDENTIAL SOIL IN ANNISTON, ALABAMA James Olson
- 14:20 1292 PREDICTORS OF HUMAN SERUM POLYCHLORINATED BIPHENYLS (PCBS) CONCENTRATIONS IN THE ANNISTON COMMUNITY HEALTH SURVEY Marian Pavuk
- 14:40 1281 ASSOCIATIONS BETWEEN BLOOD PRESSURE AND SERUM LEVELS OF PCB CONGENERS AND CHLORINATED PESTICIDES Marian Pavuk
- 15:00 1293 METABOLIC SYNDROME AND PESTICIDE EXPOSURE IN THE ANNISTON COMMUNITY HEALTH SURVEY Paula Rosenbaum

15:50 1227 — NEW ORDINANCE ON PCB IN SWEDEN AND FOLLOW-UP OF THE IDENTIFICATION AND DECONTAMINATION OF PCB-CONTAINING BUILDINGS Niklas Johansson

- 16:10 1025 PERFLUOROALKYL COMPOUNDS IN INDOOR DUST FROM UK CARS, CLASSROOMS, HOMES, AND OFFICES: AN ASSESSMENT OF UK EXPOSURE VIA DUST INGESTION Stuart Harrad
- 16:30 1483 POST-REMEDIATION INDOOR AIR AND SUB-SLAB PASSIVE VENTING SYSTEM POLYCHLORINATED BIPHENYL (PCB) AND VOLATILE ORGANIC COMPOUND (VOC) SAMPLING AT A NEW ENGLAND SCHOOL BUILDING CONSTRUCTED AT A BROWNFIELDS SITE. David Sullivan
- 16:50 1161 PCBS IN BUILDING MATERIALS -CAULK Thomas Simons

Risk Assessment, Management, and Regulation

- 14:00 1089 DIFFERENT EFFECTS OF ORGANOCHLORINE COMPOUNDS IN CONCENTRATIONS ON WHOLE AND LIPID WEIGHT BASES ON HUMAN HEALTH Junya Nagayama
- 14:20 1226 USING HUMAN IN VIVO AHR ACTIVATION AS A FUNCTIONAL DOSE METRIC FOR RISK ASSESSMENT BASED ON CHLORACNE, EFFECTS IN KERATINOCYTES AND BACKGROUND CYP INDUCTION Ted Simon
- 14:40 1255 DIOXINS IN CLAY PRODUCTS USED DURING PREGNANCY Ron Hoogenboom
- 15:00 1493 PBDES AND THEIR REPLACEMENTS: DOES THE BENEFIT JUSTIFY THE HARM? Arlene Blum
- 15:50 1542 DIOXINS AND PCB IN SALMON FROM THE SOUTHERN BALTIC SEA AND REDUCTION IN LEVELS DURING PROCESSING Tommy L. Cederberg
- 16:10 1032 REGULATORY CONSEQUENCES OF PROPOSED STATE ADOPTION OF HIGH-END SUBSISTENCE FISH CONSUMPTION RATES AT SEDIMENT DIOXIN REMEDIATION SITES IN THE PACIFIC NORTHWEST Steven Ellis
- 16:30 1684 WHO/UNEP-COORDINATED EXPOSURE STUDY (2008-2009) ON LEVELS OF PERSISTENT ORGANIC POLLUTANTS (POPs) IN HUMAN MILK WITH REGARD TO THE GLOBAL MONITORING PLAN Rainer Malisch
- 16:50 1567 PBDES AS "NEW POPS" -CHALLENGES AND KNOWLEDGE GAPS OF CONTROLLING PBDES UNDER THE STOCKHOLM CONVENTION Roland Weber Morning Session

Tuesday, September 14, 2010 — Morning Sessions

Emission Control



Dioxin-Like Compounds in Urban Waterbodies

- 9:45 1656 COMPARATIVE DISTRIBUTION, SOURCING, AND CHEMICAL BEHAVIOR OF PCDD/FS AND PCBS IN AN ESTUARY ENVIRONMENT Nathan Howell
- 10:05 1677 ROLE OF BLACK CARBON AND AMORPHOUS ORGANIC CARBON ON THE PARTITION OF DIOXINA AND OTHER HYDROPHOBIC ORGANIC CONTAMINANTS IN SEDIMENTS OF THE SAN JACINTO SUPER FUND SITE, HOUSTON SHIP CHANNEL Patrick Louchouarn
- 10:25 1437 EVALUATION OF POLYCHLORINATED NAPHTHALENES (PCNS) IN NEWARK BAY SEDIMENT Jonathan Urban
- 10:45 1674 BIOACCUMULATION OF DIOXINS AND PCBS IN FISH TISSUE IN AN URBAN ESTUARY Hanadi Rifai
- 11:05 1670 FACTORS INFLUENCING MICROBIAL DEGRADATION OF DIOXINS IN THE HOUSTON SHIP CHANNEL AND GALVESTON BAY, TEXAS Robin Brinkmeyer
- 11:25 1666 RECONSTRUCTING HISTORICAL DIOXIN CONTAMINATION IN THE HOUSTON SHIP CHANNEL AND GALVESTON BAY, TEXAS BY SEDIMENT RADIODATING Kevin Yeager
- 11:45 1672 DIOXIN AND PCB TMDLS IN THE HOUSTON SHIP CHANNEL AND GALVESTON BAY SYSTEM: WHERE AND WHY Larry Koenig

Epid

- 9:45 1285 PCDD/PCDF EMISSIONS OF MODERN DIESEL DIRECT INJECTION POWERTRAINS AND THEIR AFTERTREATMENT SYSTEM Andreas Hovemann
- 10:05 1021 —POLYCHLORINATED DIBENZO-P-DIOXIN AND DIBENZOFURAN EMISSIONS FROM THE STARTING-UP AND NORMAL OPERATION OF A HAZARDOUS WASTE INCINERATOR IN CHINA Shengyong Lu
- 10:25 1094 PREDICTION OR DETECTION OF I-TEQ EMISSION FROM PCDD/F CONGENERS, PCBZ AND PROCESS PARAMETERS IN A WTE PLANT Ma t Brugioni
- 10:45 1385 CHARACTERISTICS OF PCDD/F FORMATION IN THE SECONDARY COPPER SMELTING PROCESS Hung Pao-Chen
- 11:05 1386 APPLICATION OF MULTI-LAYER MOVING BED REACTOR FOR REMOVING PCDD/F FROM SINTERING PROCESS Chang Moo-Been
- 11:25 1527 ENVIRONMENTAL AND ECONOMIC STUDY ON DIOXIN REDUCTION DURING CEMENT PRODUCTION IN A NEW DRY CEMENT ROTARY KILN Peng Zheng
- 11:45 1452 LOW-TEMPERATURE DEGRADATION OF POLYCHLORINATED BIPHENYLS USING ACTIVATED CARBON-SUPPORTED TRANSITION METALS Yifei Sun

Epidemiology of POPs

- 9:45 1294 ASSOCIATIONS OF PCB EXPOSURE AND ENDOGENOUS HORMONES WITH HISTORY OF DIABETES IN POSTMENOPAUSAL WOMEN PREVIOUSLY EMPLOYED AT A CAPACITOR MANUFACTURING PLANT Victoria Persky
- 10:05 1551 CHRONIC DIOXIN EXPOSURE AND INCREASED RISK OF OSTEOPOROSIS Shu-Li Wang
- 10:25 1073 OVERVIEW OF SOME RECENT PFOA RESEARCH IN THE MID-OHIO VALLEY CONDUCTED BY THE C8 SCIENCE PANEL Kyle Steenland
- 10:45 1565 PUBERTY IN GIRLS IN RELATION TO SERUM BIOMARKERS OF PERSISTENT ORGANIC POLLUTANTS Gayle Windham

Epidemiology of POPs

- 11:05 1024 SERUM DIOXIN CONCENTRATIONS AND BONE MINERAL DENSITY IN THE SEVESO WOMEN S HEALTH STUDY Brenda Eskenazi
- 11:25 1174 SYSTEMIC STUDY ON ASSOCATION BETWEEN BREAST CANCER AND DIOXIN Fung-Chang Sung
- 11:45 1271 THYROID HORMONES AND EXPOSURE TO PCBS AND DDE: A STUDY OF GREAT LAKES SPORT FISH CONSUMERS IN 1994-1995 AND 2004-2005 Mary Turyk

Human Exposure to Brominated Compounds

- 9:45 1539 TRANSFER OF POLYBROMINATED DIPHENYLETHERS (PBDES) FROM MOTHER TO CHILD Johan Fang
- 10:05 1298 EXPOSURE TO PBDES IN OFFICES: CONNECTING DUST, HANDWIPES, AND SERUM Deborah Watkins
- 10:25 1202 COMPARISONS OF PBDE AND HBCD CONCENTRATIONS IN DUST COLLECTED BY TWO DIFFERENT SAMPLING METHODS AND THEIR ASSOCIATION TO HUMAN BREAST MILK CONCENTRATIONS Justina Bjorklund
- 10:45 1394 PERSISTENT ORGANIC POLLUTANTS IN CHILDREN WORKING AND LIVING AT URBAN WASTE DISPOSAL SITES IN NICARAGUA AND BANGLADESH Linda Linderholm
- 11:05 1066 ASSESSMENT OF HUMAN EXPOSURE TO POLYCHLORINATED BIPHENYLS AND BROMINATED FLAME RETARDANTS IN INDIA Devanathan Gnanasekaran
- 11:25 1261 POLYBROMINATED DIPHENYLETHERS (PBDES) IN BALTIC SEA FISH AND EXPOSURE OF FINNISH POPULATION IN 2002 AND 2009 Anniina Suutari
- 11:45 1443 THE POLYBROMINATED FLAME RETARDANTS USED IN OUR CHILDRENS SOFT DRINKS Walter Vetter

POPs in the Environment

- 9:45 1186 THE FIRST NATIONWIDE SURVEY OF PERSISTENT PERFLUORINATED COMPOUNDS IN WILD ANIMAL IN JAPAN - WILD RAT -Nobuyoshi Yamashita
- 10:05 1435 40 YEARS OF POPS MONITORING WITH PEREGRINE FALCON EGGS IN BADEN -WUERTTEMBERG/ GERMANY: RECENT RESULTS Frank Neugebauer
- 10:25 1170 POPS GLOBAL DISTRIBUTION IN AMBIENT AIR SAMPLES FROM MONET NETWORK Ivan Holoubek
- 10:45 1238 SHORT-TERM VARIABILITY IN POLYBROMINATED DIPHENYL ETHER CONCENTRATIONS DURING AND AFTER A SEVERE DUST STORM EPISODE IN KUWAIT CITY, KUWAIT Bondi Gevao
- 11:05 1432 EXPERIENCES OF THE FIRST STAGE OF OPERATION OF THE MEXICAN DIOXIN AND FURAN AIR MONITORING NETWORK Beatriz Cardenas
- **11:25** 1500 POLYCHLORINATED BIPHENYLES IN THE ATMOSPHERE OF SEVEN MAJOR INDIAN CITIES Paromita Chakraborty
- 11:45 1563 SOURCES OF ERROR IN SAMPLING AND ANALYSIS OF PCBS IN INDOOR AIR Kyle Hilst



Contaminated Sites: Cases. Current Issues Regarding Human Health Risks Posed By Dioxin Like Compounds — Remediation. Risk and Policy — Part 1 Part 1 14:00 1154 — PCB FISH CONTAMINATION 14:00 1582 — AN OVERVIEW OF EPA S REANALYSIS OF the Environment IN SWISS RIVERS - TRACING OF KEY ISSUES RELATED TO DIOXIN TOXICITY AND POINT SOURCES **RESPONSE TO NAS COMMENTS** Markus Zennegg Peter Preuss 14:20 1304 — HCH/DDT CONTAMINATION 14:20 1583 — THE APPLICATION OF STUDY SELECTION Walter Shields CRITERIA TO TCDD EPIDEMIOLOGIC STUDIES AND AROUND FORMER **ORGANOCHLORINE PRODUCTIONS** ANIMAL BIOASSAYS FOR DEVELOPMENT OF A IN BRAZIL AND A PRELIMINARY REFERENCE DOSE AND CANCER ORAL SLOPE HUMAN RISK ASSESSMENT FACTOR Joao Paulo Machado Torres Linda Teuschler Yves Tondeur 14:40 1560 — CASE STUDY TO 14:40 1584 — OVERVIEW OF DIOXIN KINETICS AND ESTABLISH BACKGROUND SOIL APPLICATION OF DIOXIN PHYSIOLOGICALLY-BASED CONCENTRATIONS OF PCDD/FS PHARMACOKINETIC (PBPK) MODELS TO RISK ASSESSMENT Court Sandau Hisham El-Masri SAWMILL SITE 15:00 1393 — PFOA- CONTAMINATED Steven Huntley 15:00 1562 — DESIGN AND APPLICATION OF A SITE SURROUNDING A TEFLON MANUFACTURING FACILITY PHYSIOLOGICALLY-BASED PHARMACOKINETIC 15.00 Veronica Vieira (PBPK) MODEL FOR TCDD DOSE-RESPONSE MODELING AS A TOOL FOR HUMAN RISK 15:50 1507 — DISCOVERY AND ASSESSMENT. INVESTIGATION OF PFOS/PFCS Claude Emond FINGERPRINTING CONTAMINATION FROM A PFC Glenn Johnson MANUFACTURING FACILITY IN 15:50 1588 — THE U.S. EPA S DRAFT REFERENCE DOSE MINNESOTA - ENVIRONMENTAL (RFD) FOR 2.3.7.8-TETRACHLORODIBENZO-P-DIOXIN 15:50 RELEASES AND EXPOSURE RISKS (TCDD) Fardiin Oliaei Jeff Swartout 16:10 1168 — APPLICATION OF A HUMAN 16:10 1587 — CANCER CLASSIFICATION AND MODE OF **Donald Patterson** ACTION FOR 2.3.7.8-TETRACHLORODIBENZO-P-EXPOSUBE MODEL IN A PCDD/E CONTAMINATED SITE CASE DIOXIN (TCDD) STUDY - EVALUATION OF MODEL Janet Hess-Wilson PERFORMANCE AND ASSOCIATED 16:30 1585 — THE U.S. EPA S DRAFT ORAL SLOPE FACTOR UNCERTAINTIES Tarek Saba (OSF) FOR 2.3.7.8-TETRACHLORODIBENZO-P-DIOXIN Karin Wiberg (TCDD) **16:30** 1387 — DEVELOPMENT OF A Glenn Rice UNIDO METHODOLOGY FOR POPS 16:50 1586 — DEVELOPMENT OF ILLUSTRATIVE ORAL CONTAMINATED SITES: SITE RFDS FOR 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN ASSESSMENTS IN GHANA AND HYDROGEN ISOTOPES. (TCDD)-INDUCED CARCINOGENESIS NIGERIA Paul Philp Belinda Hawkins Carmela Centeno 17:10 1590 — FEASIBILITY OF DEVELOPING A 16:50 1494 — THE POPS TOOLKIT QUANTITATIVE UNCERTAINTY ANALYSIS FOR AND CONTAMINATED SITE RISK 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD) MANAGEMENT IN SOUTH-EAST DOSE-RESPONSE MODELS ASIA (WWW.POPSTOOLKIT.COM) Lisa Rodenburg Roger Cooke Thomas Boivin

Environmental Forensics — State of Knowledge in **Determining the Sources & Fate** of Organohalogen Compounds in

- **14:00** 1450 PCDD/F FINGERPRINTING WITH 17 CONGENERS - WHAT ABOUT THE OTHER 193?
- 14:20 1097 ENVIRONMENTAL RELEASE OF DIOXINS FROM RESERVOIR SOURCES DURING BEACH NOURISHMENT PROGRAMS
- 14:40 1162 DETERMINATION OF SITE-SPECIFIC PCDD/PCDF AMBIENT SOIL CONCENTRATIONS AT A FORMER
- 1669 FUZZY-C-MEANS CLUSTERING: AN ALTERNATIVE TO PCA-BASED RECEPTOR/ MIXING MODELS FOR PCDD/F
- 1667 COMPREHENSIVE FINGERPRINTING OF CHEMICAL MIXTURES FOR ENVIRONMENTAL AND BIOLOGICAL FORENSICS
- 16:10 1524 CONGENER-BASED ANALYSIS OF THE WEATHERING OF PCBS IN PAPER MILL SLUDGE
- 16:30 1579 SOURCE DIFFERENTIATION OF CHLORINATED COMPOUNDS IN THE ENVIRONMENT ON THE BASIS OF CARBON, CHLORINE AND
- 16:50 1018 EVIDENCE FOR EXTENSIVE DECHLORINATION OF PCBS IN SEWERS, LANDFILLS, AND CONTAMINATED GROUNDWATER

Flame-Retardants in a Post-**PBDE World**

- 14:00 1301 FLAME RETARDANTS IN THE SERUM OF PET DOGS Marta Venier
- 14:20 1291 TOXICOKINETICS OF 1.2-DIBROMO-4-(1.2-DIBROMOETHYL)CYCLOHEXANE IN JUVENILE BROWN TROUT (SALMO TRUTTA) AND EFFECTS ON PLASMA SEX HORMONES Gregg Tomy
- 14:40 1303 TRIS(BROMOCRESYL) PHOSPHATE FLAME RETARDANT **ISOMERS ARE IDENTIFIED IN** HERRING GULLS FROM THE LAURENTIAN GREAT LAKES OF NORTH AMERICA Da Chen
- 15:00 1299 NEUROTOXICITY OF A PENTABDE REPLACEMENT TRIS (1,3-DICHLOROPROPYL) PHOSPHATE: STUDIES IN PC12 CELLS Laura Dishaw
- 15:50 1310 IDENTIFICATION OF FLAME RETARDANTS IN POLYURETHANE FOAM COLLECTED FROM BABY PRODUCTS Heather Stapleton
- 16:10 1358 OCCURRENCE OF **ORGANOPHOSPHATE FLAME** RETARDANTS AND PLASTICIZERS IN A LAUNDRY FACTORY FOR HOME AND OFFICE Hidetaka Takigami
- 16:30 1322 PRELIMINARY HUMAN EXPOSURE ASSESSMENT TO ALTERNATIVE FLAME RETARDANTS FROM INDOOR DUST IN BELGIUM Adrian Covaci
- **16:50** 1406 PENTABDE ALTERNATIVES IN U.S. INDOOR ENVIRONMENTS Thomas Webster

POPs in Marine Mammals: Levels. Trends. and Effects

- 14:00 1388 POLYCHLORINATED BIPHENYLS (PCBS) AND HYDROXYLATED PCBS (OH-PCBS) IN THREE PORPOISE SPECIES: ACCUMULATION FEATURES AND METABOLIC CAPACITY Mari Ochiai
- 14:20 1614 CONTAMINATION STATUS AND ACCUMULATION FEATURES OF PCDDS, PCDFS AND DIOXIN-LIKE PCBS IN FINLESS PORPOISES (NEOPHOCAENA PHOCAENOIDES) FROM KOREAN COASTAL WATERS Hvo-Bang Moon
- 14:40 1459 DIOXIN RELATED CONTAMINANTS IN LAKE ONTARIO AMERICAN EEL: A LIKELY CAUSE FOR THEIR DECLINE? Jonathan Byer
- 15:00 1258 MEO-PBDES, HO-PBDES AND HO-PCBS IN LIVER SAMPLES OF HARBOR SEALS FROM THE NORTHWEST ATLANTIC Adrian Covaci
- 15:50 1252 PHYSIOLOGICALLY BASED PHARMACOKINETIC (PBPK) MODELS FOR THE BIOACCUMULATION OF PBDES IN MALE HARBOUR PORPOISES Liesbeth Weiis
- 16:10 1512 LEVELS OF ORGANOHALOGEN CONTAMINANTS AND PARASITIC INFECTION IN FINLESS PORPOISES FROM JAPAN Tomohiko Isobe
- 16:30 1333 ACCUMULATION FEATURES OF HYDROXYLATED POLYBLOMINATED DIPHENYL ETHERS (OH-PBDES) IN TH BLOOD OF TOOTHED AND BALEEN WHALES STRANDED AT JAPANESE COASTAL WATERS Kei Nomiyama
- 16:50 1463 LEVELS OF PERFLUORINATED CHEMICALS (PFCS) IN MARINE MAMMALS IN ARCTIC AREAS OF THE NORDIC COUNTRIES DURING THREE DECADES (1984-2007) Anna Rotander



Current Issues Regarding Human Health Risks Posed By Dioxin Like Compounds — Part 2

- 9:45 1581 MODE OF ACTION FOR 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN CARCINOGENICITY Robert Budinsky
- 10:05 1538 LINEAR VS. NONLINEAR EXTRAPOLATION FOR DOSE-RESPONSE ASSESSMENT OF TCDD Ted Simon
- 10:25 1265 ASSESSING THE CUMULATIVE EFFECTS OF MIXTURES: LESSONS LEARNED FROM THE NTP CHRONIC BIOASSAYS OF MIXTURES OF DIOXINS AND PCBS. Nigel Walker
- 10:45 1433 REVIEW AND RECALCULATION OF THE U.S. EPA DRAFT PROPOSED REFERENCE DOSE (RFD) FOR 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN BASED ON WEIGHT OF EVIDENCE METHODS Lesa Aylward
- 11:05 1681 REGULATORY IMPLICATIONS OF USEPA S DRAFT ORAL SLOPE FACTOR AND REFERENCE DOSE FOR DIOXIN Joseph Haney
- 11:25 1178 INTERIM PRELIMINARY REMEDIATION GOALS FOR DIOXIN IN SOIL Marlene Berg
- 11:45 1683 IMPLICATIONS OF THE EPA S NEW PRELIMINARY REMEDIATION GOALS FOR RESIDENTIAL SOIL BASED ON THE UNIVERSITY OF MICHIGAN DIOXIN EXPOSURE STUDY Alfred Franzblau

Emerging and Naturally Occurring Compounds in the Environment

- 9:45 1505 DECHLORANE PLUS, IN THE GLOBAL ATMOSPHERIC PASSIVE SAMPLING (GAPS) STUDY Ed Sverko
- 10:05 1370 ACCUMULATION OF A FUNGI-DERIVED TERRESTRIAL HALOGENATED NATURAL PRODUCT IN WILD BOAR (SUS SCROFA) Walter Vetter
- 10:25 1334 ACCUMULATION FEATURES OF ANTHROPOGENIC AND NATURALLY PRODUCTED ORGANOHALOGEN COMPOUNDS IN HUMAN SERUM FROM INDIAN E-WASTE RECYCLING WORKERS AND RESIDENTS NEAR COASTAL AREAS Akifumi Eguchi
- 10:45 1129 IMPACT OF TRICLOSAN ON THE FORMATION OF POLYCHLORINATED DIOXINS AND FURANS (PCDD/FS) IN WATER Michael Flournoy
- 11:05 1125 PBDE METABOLITES ARE HIGHER THAN PARENT PBDES IN PELAGIC NORTH PACIFIC ALBATROSS: NATURAL OCCURRANCE? June-Soo Park
- 11:25 1600 THE EMERGING BFRS -HEXABROMOBENZENE (HBB), BIS(246-TRIBROMOPHENOXY)ETHANE (BTBPE) AND DECABROMODIPHENYLETHANE (DBDPE) - IN IRISH FOODS Christina Tlustos
- 11:45 1454 OH-PBDES AND MEO-PBDES IN SWEDISH MARINE AND FRESH WATER ENVIRONMENT - AN OVERVIEW Lillemor Asplund

Human Exposure to Dioxins and PCBs

- 9:45 1348 DIOXIN-RELATED COMPOUNDS IN HOUSE DUST FROM VIETNAMESE E-WASTE RECYCLING SITES: COMPARISON OF IN VITRO BIOASSAY-AND CHEMICAL ANALYSIS-DERIVED TOXIC EQUIVALENTS Nguyen Minh Tue
- **10:05** 1250 DIETARY INTAKE OF PCDD/F AND DIOXIN-LIKE PCB FOR THE BELGIAN POPULATION Jean-Francois Focant
- 10:25 1362 DANISH MONITORING OF DIOXINS AND PCB IN FOOD AND FEED DURING THE YEARS 2000 TO 2009 -LEVELS, TIME TREND AND HUMAN EXPOSURE Tommy L. Cederberg
- 10:45 1287 DIOXINS IN ORGANIC EGGS DUE TO CONTAMINATED CORN Wim Traag
- 11:05 1547 GENDER SPECIFIC DIFFERENCES IN LEVELS OF PERSISTENT ORGANIC POLLUTANTS -A PROSPECTIVE COHORT STUDY (N=988) Samira Salihovic
- 11:25 1572 DIOXIN INTAKE DUE TO FISH AND GAME CONSUMPTION IN A DIOXIN-CONTAMINATED AREA Wei Hao
- 11:45 1531 BROMINATED AND MIXED HALOGENATED DIOXINS AND FURANS (PBDD/FS) IN FOODS - A SIGNIFICANT CONTRIBUTION TO OVERALL DIOXIN-LIKE TOXICITY FOR SOME FOODS Martin Rose

Sampling Strategies, Preparation and Quality Assurance Aspects of POPs Analysis

- 9:45 1495 EVIDENCE OF TWO SOURCES OF FALSE POSITIVE RESULTS IN ANALYSIS OF ENVIRONMENTAL SAMPLES FOR DIOXINS Sean Gormley
- 10:05 1533 THE ARTIFACT FORMATION OF POPS DURING STACK FLUE GAS SAMPLING? PRELIMINARY RESULT OF TEMPERATURE PROFILES Chau Phan DN
- 10:25 1568 STABILITY FACTORS INFLUENCING THE ANALYSIS OF ENVIRONMENTAL ORGANIC CHEMICALS Jianwen She
- 10:45 1604 PASSIVE SAMPLING TO ASSESS THE BIOAVAILABILITY OF HALOGENATED AROMATIC COMPOUNDS IN AQUATIC SYSTEMS David Thal
- 11:05 1210 SELECTIVE PRESSURIZED LIQUID EXTRACTION OF DIOXINS IN SOIL: OPTIMIZATION USING EXPERIMENTAL DESIGN Lan Do Thanh
- 11:25 1166 PCB AND OCP RESULTS OF FIRST WORLDWIDE UNEP INTERLABORABORY STUDY ON PERSISTENT ORGANIC POLLUTANTS -PHASE 1 Jacob de Boer
- 11:45 1137 INTERLABORATORY STUDIES FOR PCDD/FS AND PCBS IN FEED AND FOOD - RESULTS FROM APPLICATION OF PHYSICO-CHEMICAL AND BIOANALYTICAL METHODS -Alexander Kotz

Toxicology of Brominated and Fluorinated Compounds

- 9:45 1593 IMPACTS OF DIETARY TETRABROMOETHYLCYCLOHEXANE (TBECH) ON THE THYROID AXIS OF BROWN TROUT (SALMO TRUTTA) Vince Palace
- 10:05 1436 METABOLISM OF A- AND ?-HEXABROMOCYCLODODECANE AND ENANTIOSELECTIVE FRACTIONS OF A-, -, ?-ISOMERS IN MICE Heldur Hakk
- 10:25 1104 INHIBITION OF THE DEPOLARIZATION-EVOKED INCREASE IN INTRACELLULAR CALCIUM LEVELS AND CATECHOLAMINE EXOCYTOSIS BY HEXABROMOCYCLODODECANE (HBCD) IN PC12 CELLS Remco Westerink
- 10:45 1503 IMPACTS OF POLYBROMINATED DIPHENYL ETHERS (PBDES) ON THE METABOLISM OF THYROID HORMONES IN EARLY LIFE STAGES OF FATHEAD MINNOWS (PIMEPHALES PROMELAS) Pamela Noyes
- 11:05 1389 POLYBROMINATED DIPHENYL ETHERS AND THEIR METABOLITES, A POTENTIAL CAUSE FOR THE DEVELOPMENT OF THE ENDOCRINE DISORDER HYPERTHYROIDISM IN CATS? Jessica Norrgran
- 11:25 1440 NIEHS/NTP STUDIES OF POLYBROMINATED DIPHENYL ETHERS June Dunnick
- 11:45 1564 MEASURING IMPACTS OF HALOGENATED PHENOLIC COMPOUNDS ON THYROID REGULATING DEIODINASE ACTIVITY USING IN VITRO TECHNIQUES Craig Butt



Contaminated Sites: Cases, Remediation, Risk and Policy — Part 2

- 9:45 1142 A MENTAL MODELS FRAMEWORK FOR CONSIDERING COMMUNITY PERCEPTIONS OF DIOXIN-LIKE COMPOUNDS Julia Diebol
- 10:05 1213 REMOVAL OF DIOXINS FROM WATER GENERATED DURING WETLAND SEDIMENT REMOVAL USING ADVANCED OXIDATION Edward Conti
- 10:25 1306 ASSESSMENT OF POLYCHLORINATED BIPHENYLS (PCBS) CONTAMINATION IN SURFACE AND SUBSURFACE SOILS OF AN OLD POWER GENERATING STATION IN LAGOS, NIGERIA Babajide Alo
- 10:45 1379 PFOS AND PFC POLLUTION FROM USE OF FIRE FIGHTING FOAM IN A MAJOR FIRE IN D SSELDORF/ GERMANY - HUMAN EXPOSURE AND REGULATORY ACTIONS Roland Weber
- 11:05 1439 ASSESSMENT OF A QUICK SCREENING METHOD FOR CHARACTERIZING DIOXIN-CONTAMINATED SOIL - WITH A CASE STUDY OF CPDC AN-SHUN SITE Chih C. Chao
- 11:25 1540 ON-SITE REMEDIATION OR REMOVAL OFF-SITE TREATMENT -STRATEGY FOR POPS PESTICIDE SITES IN CHINA Jianxin Zhu
- 11:45 1428 DIOXIN CONTAMINATION OF SOILS: ASSESSING ENVIRONMENTAL RISK APPLYING A WEIGHT OF EVIDENCE TRIAD APPROACH Alessandro Dagnino

Developmental Neurotoxicity of PBDEs - Mechanisms to Functional Consequences

- 9:45 1152 THE LINK BETWEEN ADULT BEHAVIORAL EFFECTS OF PBDES AND ALTERATIONS IN PROTEIN LEVELS IN THE NEONATAL BRAIN Henrik Viberg
- 10:05 1103 HYDROXYLATION INCREASES THE NEUROTOXIC POTENTIAL OF THE BROMINATED FLAME RETARDANT BDE-47: THE STRUCTURE OF BDE-47 METABOLITES DETERMINES THE POTENCY TO AFFECT CALCIUM HOMEOSTASIS IN PC12 CELLS Bemco Westerink
- 10:25 1678 COMPARATIVE EFFECTS OF PBDES AND PCBS ON INTRACELLULAR SIGNALING IN RAT CEREBELLAR GRANULE NEURONS Prasada Rao Kodavanti
- 10:45 1470 INTERACTIVE EFFECTS OF POLYCHLORINATED BIPHENYLS (PCBS) AND POLYBROMINATED DIPHENYL ETHERS (PBDES) ON COCHLEAR FUNCTION Susan Schantz
- 11:05 1474 DEVELOPMENTAL EXPOSURE TO PBDES AND ENVIRONMENTAL TOXICANTS: EFFECTS AND FUNCTIONAL CONSEQUENCES LATER IN LIFE Per Eriksson
- 11:25 1141 PRENATAL EXPOSURE TO PBDES AND NEURODEVELOPMENT Julie Herbstman
- 11:45 1278 SERUM LEVELS OF DECABROMODIPHENYLETHER (DECABDE) IN WOMEN FROM FOUR EUROPEAN COUNTRIES AND POSSIBLE RELATIONSHIPS WITH LIFESTYLE, DIET AND RISK. Martin van den Berg

Fluorinated Compounds — Fate and Transport

- 9:45 1165 SORPTION OF PFOS AND PFOA ON ACTIVATED SLUDGE shubo deng
- 10:05 1363 ANALYSIS OF PERFLUORINATED PHOSPONIC ACIDS IN WATER, SLUDGE AND SEDIMENT SAMPLES BY LC-MS/ MS Stefan van Leeuwen
- 10:25 1460 ENANTIOSELECTIVE ANALYSIS OF A PFOS ISOMER: EVIDENCE FOR THE SOURCE CONTRIBUTION OF PRECURSORS TO AQUATIC ORGANISMS IN THE GREAT LAKES Brian Asher
- 10:45 1200 PERFLUORINATED CHEMICALS IN GLACIAL ICE CORE SAMPLES FROM THE EUROPEAN ARCTIC Karen Kwok
- 11:05 1544 ENVIRONMENTAL CONTAMINATION AND ISOMER PATTERNS OF PFAAS AND 6:2 FTS CLOSE TO A FIRE-FIGHTING TRAINING FACILITY Anna Karrman
- 11:25 1235 THE DISTRIBUTION AND FATE OF POLYFLOURINATED COMPOUNDS IN WASTE WATER TREATMENT (WWTP) PLANT IN CHINA Zhang Yating
- 11:45 1557 PERFLUORINATED COMPOUNDS IN SURFACE SEDIMENTS AND CORES FROM LAKE ONTARIO Leo W.Y. Yeung

Global Fate & Long Range Transport

- 9:45 1355 EVALUATING THE ENVIRONMENTAL PERSISTENCE AND LONG-RANGE TRANSPORT OF ENDOSULFAN Martin Scheringer
- 10:05 1534 MEASUREMENT OF VAPOR PRESSURES OF SOME PBDES AND NON-PBDE FLAME RETARDANTS AND EVALUATION OF THEIR PERSISTENCE AND LONG-RANGE TRANSPORTATION POTENTIAL Hidetoshi Kuramochi
- 10:25 1081 SEASONAL AND ALTITUDINAL VARIATIONS OF LEGACY AND CURRENT-USE PESTICIDES IN THE BRAZILIAN TROPICAL AND SUBTROPICAL MOUNTAINS Rodrigo Meire
- 10:45 1035 ENVIRONMENTAL CHEMISTRY MEETS GLACIOLOGY: TRANSPORT AND FATE OF POYCHLORINATED BIPHENYLS (PCB) IN THE GLACIER AND LAKE OBERAAR, SWITZERLAND Christian Bogdal
- 11:05 1160 BROMINATED FLAME RETARDANTS IN THE ARCTIC - SPATIAL AND TEMPORAL TRENDS AND NEW CANDIDATES Cynthia de Wit
- 11:25 1026 FATE OF DIOXINS IN A BOREAL FOREST CATCHMENT Magnus Bergknut
- 11:45 1441 FLAME RETARDANTS AND LEGACY CONTAMINANTS IN POLAR BEARS FROM ALASKA, CANADA, EAST GREENLAND AND SVALBARD: SPATIOTEMPORAL TRENDS AND THE ROLE OF DIET Robert Letcher

HBCD Part 1 — Wildlife Toxicology and Exposure

- 9:45 1409 IN VITRO METABOLISM OF HBCD ISOMERS BY RAT LIVER MICOSOMES Laurence Roosens
- 10:05 1280 TOXIC EFFECT OF THE BROMINATED FLAME RETARANTS BDE-47 AND HBCD IN NEURONAL CELL MODELS. Valentina Reffatto
- 10:25 1416 INVESTIGATION OF HBCD METABOLISM IN MARINE MAMMALS FROM CANADA USING A HEPATIC MICROSOMAL IN VITRO BIOASSAY APPROACH AND COMPARISON WITH FIELD SAMPLES Gordia MacInnis
- 10:45 1264 HEXABROMOCYCLODODECANE IN PEREGRINE FALCON (FALCO PEREGRINUS) EGGS FROM CANADA AND SPAIN: LEVELS AND ENANTIOMERIC PATTERNS Paula Guerra
- 11:05 1119 EVIDENCE OF ENDOCRINE DISRUPTION AND TESTICULAR CHANGES IN MALE AMERICAN KESTRELS (FALCO SPARVERIUS) EXPOSED TO TECHNICAL HBCD Sarah Marteinson
- 11:25 1120 CHANGES IN REPRODUCTION AND BEHAVIOR OF AMERICAN KESTRELS (FALCO SPARVERIUS) ASSOCIATED WITH EXPOSURE TO ENVIRONMENTALLY RELEVANT CONCENTRATIONS OF TECHNICAL HBCD Kim Femie
- 11:45 1220 IN VIVO STEREOISOMERIZATION OF HBCD GAMMA AND ALPHA IS TISSUE AND STEREOISOMER SPECIFIC David Szabo



Exposures to Dioxin-Like Compounds in Soil and the Potential Impact on Human Health

- 14:00 1077 HISTORICAL AND CURRENT TRENDS IN DIOXIN EXPOSURE - A REVIEW Matthew Lorber
- 14:20 1647 DIOXIN CONTAMINATED SOILS: AN HISTORICAL PERSPECTIVE ON RISK. Michael DeVito
- 14:40 1541 THE UNIVERSITY OF MICHIGAN DIOXIN EXPOSURE STUDY: RESIDENTIAL SOIL AND HOUSEHOLD DUST UNRELATED TO SERUM DIOXIN LEVELS David Garabrant
- 15:00 1546 SERUM CONCENTRATIONS OF DIOXIN-LIKE COMPOUNDS IN A POPULATION IN MIDLAND MICHIGAN: AN EVALUATION OF THE IMPACT OF SOIL EXPOSURES Mark Harris
- 15:50 1448 COHORT OF WOMEN LIVING IN A HIGHLY INDUSTRIALIZED AREA OF KANAWHA RIVER VALLEY IN WEST VIRGINIA: ENDOMETRIOSIS AND BLOOD LEVELS OF DIOXIN AND DIOXIN-LIKE CHEMICALS Janet Diliberto
- 16:10 1418 SOIL-SERUM PCB ASSOCIATIONS IN THE ANNISTON COMMUNITY HEALTH SURVEY Marian Pavuk
- 16:30 1548 AN EVALUATION OF THE INFLUENCE OF DIFFERENT SOIL CLEANUP LEVELS ON THE CONCENTRATION OF DIOXIN-LIKE COMPOUNDS IN HUMAN SERUM Laurie Haws
- 16:50 1552 A TOXICOKINETIC MODELING APPROACH TO INVESTIGATE THE PREDICTORS OF SERUM TCDD CONCENTRATION Wei Hao

HBCD Part 2— Environmental Fate and Distribution

- 14:00 1167 HEXABROMOCYCLODODECANE (HBCD) IN FISH OIL FOOD SUPPLEMENTS Thea Rawn
- 14:20 1091 AN OVERVIEW OF CONTAMINATION OF THE UK ENVIRONMENT WITH HBCD AND ITS DEGRADATION PRODUCTS Stuart Harrad
- 14:40 1207 PROGRESS UPDATE ON CERTIFYING HBCD IN NIST STANDARD REFERENCE MATERIALS (SRMS) John Kucklick
- 15:00 1195 HPLC BEHAVIOUR OF THE ISOMERS OF HEXABROMOCYCLODODECANE Nicole Riddell
- 15:50 1069 GEOGRAPHICAL DISTRIBUTION AND TEMPORAL VARIATION OF PCBS, PBDES AND HBCDS IN HUMAN BREAST MILK FROM GHANA Kwadwo Ansong Asante
- 16:10 1244 IS HEXABROMOCYCLODODECANE (HBCD) A GLOBAL POP? - THE NORWEGIAN PROPOSALS TO INCLUDE HBCD IN UN CONVENTION ON POPS Georg Becher
- 16:30 1112 TIME COURSES OF HBCD LEVELS AND ENANTIOMERIC SIGNATURES IN HERRING GULL EGGS FROM THE GERMAN COAST Roland Becker
- 16:50 1033 LEVELS OF HBCDS AND DEGRADATION PRODUCTS IN UK HUMAN MILK AND RELATIONSHIP TO EXTERNAL EXPOSURE Stuart Harrad

New Biological Roles for the Misunderstood Aryl-Hydrocarbon Receptor

- 14:00 1657 THE AIP PROTEIN (AKA ARA9) IS REQUIRED FOR DIOXIN HEPATOTOXICITY Christopher Bradfield
- 14:20 1163 THE ROLE OF THE ARYL-HYDROCARBON RECEPTOR IN MAMMARY DIFFERENTIATION AND DISEASE Russell Thomas
- 14:40 1284 DIFFERENTIAL GENOMICS EFFECTS OF HEPATOCARCINOGENIC AND ANTI-CARCINOGENIC AHR ACTIVATORS IN RAT LIVER Scott Auerbach
- 15:00 1659 NATURAL SOURCES OF AHR AGONIST ACTIVITY Craig Rowlands
- 15:50 1118 AH RECEPTOR AGONISTS, ANTAGONISTS AND SAHRMS: DISSECTION OF AH RECEPTOR PHYSIOLOGY Gary Perdew
- 16:10 1658 THE AH RECEPTOR HAS A NOVEL ROLE AS A PHYSIOLOGICAL REGULATOR OF HEMATOPOIETIC PRECURSORS Thomas Gasiewicz
- **16:30** 1277 ARYL HYDROCARBON RECEPTOR AGONISTS INHIBIT ER-NEGATIVE BREAST CANCER CELL GROWTH, MIGRATION AND INVASION BY INDUCING MICRORNA-335 Stephen Safe
- 16:50 1155 THE ARYL HYDROCARBON RECEPTOR AS A MEDIATOR OF SERM SIGNALING Carolyn Bentley

Perfluorinated and Brominated Compounds: Analytical Approaches and Developments

- 14:00 1423 D13C VALUES OF POLYBROMINATED DIPHENYL ETHERS AND THEIR UV-TRANSFORMATION PRODUCTS Natalie Rosenfelder
- 14:20 1490 LARGE VOLUME SPLITLESS AND COLD ON-COLUMN INJECTION APPROACHES USING UNMODIFIED SPLITLESS AND PTV INJECTION PORTS FOR THE ANALYSIS OF HALOGENATED PESTICIDES AND BROMINATED FLAME RETARDANTS Michelle Misselwitz
- 14:40 1597 DEVELOPMENT OF A METHOD FOR THE DETERMINATION OF SEVERAL NOVEL HALOGENATED FLAME RETARDANTS IN MILK Eric Braekevelt
- 15:00 1098 THE IMPORTANCE OF PHYSICAL PROPERTY CONSIDERATIONS IN PREVENTING ANALYTE LOSSES IN SAMPLING AND SAMPLE PREPARATION OF HIGHLY FLUORINATED COMPOUNDS Mary Kaiser
- 15:50 1300 QUANTITATION OF PERFLUORINATED COMPOUNDS IN FOOD AT THE LOW PG/G LEVEL: DEVELOPMENT OF A TETRAHYDROFURAN-WATER EXTRACTION SYSTEM WITH IN-LINE CLEAN-UP Stefan van Leeuwen
- 16:10 1458 PERFLUORINATED CONTAMINANTS IN FISH: SOLUTION FOR ULTRA TRACE ANALYSIS Jana Hajslova
- 16:30 1188 ISO25101 AND JAPANESE INDUSTRIAL STANDARD (JIS) OF PFOS AND PFOA MEASUREMENTS IN WATER SAMPLES Sachi Taniyasu
- 16:50 1535 IMPROVEMENTS TO INDUSTRIAL HYGIENE AND SOURCE TESTING METHODS FOR PERFLUOROCHEMICALS William Mills

POPs in Soil and Sediment

- 14:00 1402 NEW HALOGENATED NORBORNENE FLAME RETARDANTS IN SEWAGE SLUDGE FROM SPAIN Adri n de la Torre
- 14:20 1254 POPS ACCUMULATED IN THE SURFACE SOIL AND A SOIL-CORE IN A NATIONAL NATURAL RESERVATION, TIANBAO ROCK, SOUTHEASTERN CHINA Qiuquan Wang
- 14:40 1060 DIOXINS AND DIOXIN-LIKE PCBS IN SOLID MATERIAL FROM THE RIVER ELBE, ITS TRIBUTARIES AND FROM THE NORTH SEA Gunther Umlauf
- 15:00 1521 A STUDY ON PERSISTENT ORGANOCHLORINE PESTICIDES IN WATER AND SEDIMENTS OF YAMUNA RIVER: YEAR 2000-2008 Bhupander Kumar
- **15:50** 1462 POLYBROMINATED DIPHENYL ETHERS IN DETROIT RIVER SEDIMENT Debbie Burniston
- 16:10 1070 TEMPORAL AND SPATIAL TRENDS OF SELECTED POPS IN RIVERINE SEDIMENTS: WHAT CAN WE LEARN FOR ASSESSMENT OF RISKS ASSOCIATED WITH FREQUENT FLOOD EVENTS? Petr Kukucka
- 16:30 1576 ASSESSMENT OF THE RELEASE OF ORGANIC CONTAMINANTS FROM SOIL USING A BATCH LEACHING TEST Silviu-Laurentiu Badea
- 16:50 1655 A PILOT STUDY ON ROOT-PROMOTING DETOXIFICATION OF PCDD/FS CONTAMINATIONED SOIL BY MAIZE PRHZOSPHERE Zhang Haijun

Advances in Analytical, Screening and Confirmatory methods

1427	GCXGC-TOFMS METHOD DEVELOPMENT FOR ROUTINE ANALYSIS OF PCB AND PBDE IN FOOD.	Anthony Adeuya
1673	EFFECT OF SOURCE TEMPERATURE ON THE ECNT/MS SPECTRA OF DECHLORANE PLUS ISOMERS	Mehran Alaee
1266	ANALYTICAL ASPECTS FOR THE DETERMINATION OF ORGANOPHOSPHATE FLAME RETARDANTS IN INDOOR DUST SAMPLES BY GC-EI-MS	DIRTU Alin C.
1245	BIO/CHEMICAL ANALYIS OF SEDIMENTS FROM THE ELBE RIVER, THE NORTH SEA AND FROM SEVERAL TRIBUTARIES	Peter Behnisch
1649	FIRST SURVEILLANCE MONITORING RESULTS OF FEED/FOOD ITEMS FROM CHILE BY DR CALUX METHOD	Peter Behnisch
1251	GENERATION OF DIOXIN RESPONSIVE CALUX H4IIE CELL LINES CONTAINING MULTIPLE DIOXIN RESPONSIVE ELEMENTS	Abraham Brouwer
1592	IMPACT OF SAMPLE SALINITY ON THE ANALYSIS OF PPCPS	Karla Buechler
1508	EVALUATION OF A NOVEL TIME-OF-FLIGHT MASS SPECTROMETER IN CONJUCTION WITH COMPREHENSIVE GAS CHROMATOGRAPHY (GCXGC) TO COMPLEMENT HIGH RESOLUTION MASS SPECTROMETRY (HRMS) FOR SCREENING HALOGENATED POPS	Nick Bukowski
1371	VALIDATION OF LONG TERM SAMPLING OF PCDD/F IN EMISSION IN MSW INCINERATORS BASED ON FILTER CONDENSER METHOD	Gilles Campognola
1397	DEVELOPMENT OF A GC-MS/MS APPROACH FOR MEASURING HEXACHLOROBENZENE (HCB) AND HEXACHLORO-1,3-BUTADIENE (HCBD) IN FISH	Ronan Cariou
1555	DETERMINATION OF PCDD/FS, PBDD/FS, PBDES, PAHS, PCBS, ORGANOCHLORINE PESTICIDES AND HEAVY METALS IN VARIOUS FISH SPECIES FROM TURKEY	gul celik cakirogullari
1445	DETERMINATION OF SHORT, MEDIUM AND LONG CHAIN POLYCHLORINATED N-ALKANES BY HYDRODECHLORINATION GC/MS: EVALUATION AND VALIDATION IN THE PRESENCE OF POTENTIALLY INTERFERING CHEMICAL	Jean Pierre Charland
1536	A NEW, HIGHLY EFFICIENT GC COLUMN FOR CHLORINATED DIOXIN AND FURAN SEPARATIONS	Jack Cochran
1307	ANALYSIS OF THE FLAME RETARDANT METABOLITE BIS (1,3-DICHLOROISOPROPYL) PHOSPHATE (BDCPP) IN URINE	Ellen Cooper
1349	ASSESSMENT OF PERSISTENT ORGANOHALOGENATED POLLUTANTS IN WHITE-TAILED SEA EAGLE FLEDGLINGS USING NON-DESTRUCTIVE BIOMONITORING STRATEGIES	Igor Eulaers
1613	DEVELOPMENT OF LOW LEVEL OH-PCBS ANALYTICAL METHOD IN HUMAN BLOOD WITH UPLC/Q-TOF MS	Tatsuya Ezaki
1236	A SIMPLIFIED METHOXIME (MO) - TRIMETHYLSILYL (TMS) DERIVATIZATION FOR SIMULTANEOUS DETERMINATION OF KETOSTEROID HORMONES BY GC-MS	Kai Fang
1525	ANALYSIS OF TRACE LEVEL ORGANOCHLORINE PESTICIDES BY HIGH- RESOLUTION MASS SPECTROMETRY	Michael Flournoy
1626	POLYCHLORINATED BIPHENYLS (PCBS) IN FISH OIL DIETARY SUPPLEMENTS BY GPC AUTOMATED CLEAN-UP METHOD	Ettore Guerriero
1076	HIGH PBDE LEVELS AND UNUSUAL CONGENER PATTERNS IN CALIFORNIA HOUSE CATS	Weihong Guo
1595	SCREENING OF GCXGC-TOFMS DATA FOR HALOGENATED COMPOUNDS USING AN AUTOMATIC ROUTINE AND APPLICATION TO HOUSE DUST	Donald Hilton
1169	GENASIS: SYSTEM FOR THE ASSESSMENT OF ENVIRONMENTAL CONTAMINATION BY PERSISTENT ORGANIC POLLUTANTS	Ivan Holoubek
1229	DESTRUCTION OF DECHLORANE PLUS BY MECHANOCHEMICAL METHOD	Jun Huang
1617	QUANTIFICATION OF DIOXIN-LIKE PCBS : PRACTICAL OPTIMALISATION OF THE EN 1948-4 PROTOCOL	Francois IDCZAK
1601	SEMI-AUTOMATED EXTRACTION AND CLEANUP METHOD FOR THE MEASUREMENT OF ORGANOHALOGEN COMPOUNDS AND HALOGENATED PHENOLS IN HUMAN SERUM	Richard Jones
1164	INSTRUMENT PERFORMANCE STANDARDS: A NEW CONCEPT FOR FAST ROUTINE PERFORMANCE CHECKS AND METHOD DEVELOPMENT IN GC/MS ANALYSIS OF DIOXINS AND FURANS	Dirk Krumwiede
1516	COMMERCIALIZATION OF A METHOD FOR TOXAPHENE USING NEGATIVE ION MASS SPECTROMETRY	Keith Maruya
1561	SOURCES OF ERRORS IN CLINICAL CHEMICAL ANALYSIS OF PCBS AND RECOMMENDED PRACTICES TO AVOID THEM	William Mills
1502	ANALYSIS OF BROMO/CHLORO DIOXINS BY GAS CHROMATOGRAPHY TANDEM MASS SPECTROMETRY (GC/MS/MS)	Anne Myers
1101	LEVELS AND DISTRIBUTION OF OCPS AND PCBS IN COASTAL MUSSELS OF CHINA BY ID-HRGC/HRMS	Yuwen Ni

1246	APPLICATION OF IMMUNOASSAY FOR SCREENING OF POLYCHLORINATED BIPHENYLS (PCBS) IN TRANSFORMER OILS	Seok-Un Park
1519	EVALUATION OF HUMAN TOENAIL AS A NON-INVASIVE BIOMONITORING MATRIX FOR ASSESSING HUMAN EXPOSURE TO ENVIRONMENTAL ORGANIC POLLUTANTS BY OPTIMIZED SAMPLE PREP AND GC/HRMS ANALYSIS	Paul Peterman
1485	ANALYSIS OF PERSISTENT HALOGENATED ORGANICS USING ATMOSPHERIC PRESSURE GAS CHROMATOGRAPHY (APGC)	Eric Reiner
1051	Evaluating ability of Applying Vietnamese Wood-Based Activated Carbon in PCDDS/PCDFS Analysis	Trinh Khac Sau
1350	DETERMINATION OF PCDDS/DFS/DL-PCBS IN DUCK EGG, SALTED DUCK EGG AND CENTURY EGG SAMPLES BY THE DR CALUX BIOASSAY	Tsyr-Horng Shyu
1092	EVALUATIONS OF POLAR AND HIGHLY POLAR IONIC LIQUID CAPILLARY GC COLUMNS WITH ENVIRONMENTAL SAMPLES	Leonard Sidisky
1643	IMPROVEMENT OF THE MEASUREMENT METHOD FOR HYDROXYLATED POLYCHLORINATED BIPHENYLS (OH-PCBS) IN BLOOD USING LC/MS/MS	Kazuhiro TOBIISHI
1288	PRACTICAL EXPERIENCE WITH THE DR CALUX ASSAY FOR SCREENING OF FOOD OF ANIMAL ORIGIN	Wim Traag
1415	ANALYTICAL CHARACTERISTICS OF THE H1L6.1 AND THE H1L7.5 MOUSE HEPATOMA CELL LINES	Kersten Van Langenhove
1037	MONITORING IODATED X-RAY CONTRAST MEDIA IN WATER SAMPLES BY LC/MS/MS	Rebecca Wittrig
1351	ULTRA-SENSITIVE DETECTION OF PESTICIDES IN DRINKING WATER WITH A SIMPLE, RAPID, AND HIGH QUALITY ANALYSIS	Keith Worrall
1212	COMPARISON OF DATA FROM THE 7000B TANDEM QUADRUPOLE GC-MS/MS VS. A TRADITIONAL GC-HRMS SYSTEM FOR THE DETERMINATION OF PCDDS AND PCDFS IN FOODSTUFFS	Phil Wylie
1201	STUDY OF FAST QUALITATIVE ANALYSIS OF PCDD/FS FROM IRON ORE SINTERING PROCESS	Li XianWei

SAN ANTONI



Perfluorinated and Brominated Compounds: Analytical Approaches and Developments

1095	ANALYTICAL BEHAVIOUR OF NOVEL BROMINATED FLAME RETARDANTS	Nadeem Ali
1337	METHOD DEVELOPMENT OF VOLATILE PERFLUORINATED COMPOUNDS IN WATER USING PURGE AND TRAP EXTRACTION - GC/MS	Yuichi HORII
1098	THE IMPORTANCE OF PHYSICAL PROPERTY CONSIDERATIONS IN PREVENTING ANALYTE LOSSES IN SAMPLING AND SAMPLE PREPARATION OF HIGHLY FLUORINATED COMPOUNDS	Mary Kaiser
1099	THE QUESTIONABLE APPLICABILITY OF BDE-175 AS AN INDICATOR FOR COMMERCIAL OCTABROMODIPHENYL ETHER	Alexandre Konstantinov
1054	EFFECT OF SOLVENT ON ELUTION OF PERFLUORINATED COMPOUNDS FROM WATER AND INDUSTRIAL WASTEWATER SAMPLES	Chinagarn Kunacheva
1687	RESULTS OF A WORLDWIDE PROFICIENCY TEST ON DETERMINATION OF PFCS IN HUMAN MILK	Gunilla Lindstrom
1629	POLYBROMINATED DIPHENYL ETHER IN SEWAGE SLUDGE IN ITALY	Andrea Manni
1366	COMPARED ANALYTICAL DEVELOPMENT AND VALIDATION BASED ON LIQUID CHROMATOGRAPHY COUPLED TO TANDEM OR HIGH RESOLUTION MASS SPECTROMETRY FOR MEASURING PERFLUORINATED COMPOUNDS IN MILK	Philippe MARCHAND
1511	DEVELOPMENT AND APPLICATION OF A LIQUID CHROMATOGRAPHY COUPLED TO HIGH RESOLUTION MASS SPECTROMETRY ANALYTICAL STRATEGY FOR MEASURING BFRS METABOLITES IN HUMAN MATRICES	Philippe MARCHAND
1344	PERFLUORINATED COMPOUNDS (PFCS) CONTENT AND ELUTION OF WASTE	Chisato Matsumura
1664	PERFLUORINATED COMPOUNDS (PFCS) CONTENT AND ELUTION OF WASTE SAMPLES	Chisato Matsumura
1193	FURTHER MINOR ISOMERS OF HEXABROMOCYCLODODECANE	Robert McCrindle
1506	APPLICATION OF GC-MS/MS FOR VOLATILE FLUOROALKYL COMPOUND ANALYSIS	Shoji Nakayama
1457	NOVEL LC-MS STRATEGY TO MONITORE BROMINATED FLAME RETARDANTS TOGETHER WITH THEIR METABOLITES IN FOOD MATRICES	Jana Pulkrabova
1234	POLYBROMINATED DIPHENYL ETHERS IN INTERNAL ORGANS OF PIGLET ACCODING TO DISEASES	Jeoung Shin
1122	FUNDAMENTAL STUDY ON ANALYTICAL METHODS FOR PERFLUOROALKYLSULFONATES AND PERFLUOROCARBOXYLICACIDS (PFASS/PFCAS) IN AMBIENT AIR	Toshiki Tojo
1422	DETERMINATION OF TOTAL ORGANIC FLUORINE IN ENVIRONMENTAL SAMPLES USING FLOW-INJECTION AND CHROMATOGRAPHIC METHODS	Marek Trojanowicz
1377	DEVELOPMENT AND VALIDATION OF AN IMPROVED ANALYTICAL METHOD FOR PERFLUORINATED PHOSPHONATES (PFPAS) IN DRINKING WATER	Shahid Ullah
1196	ANALYSIS OF 12 PFCS (PERFLUORINATED COMPOUNDS) IN HUMAN AND CAT SERUM USING ONLINE SPE-HPLC-TIS-MS/MS	Miaomiao Wang
1086	A METHOD FOR THE DETERMINATION OF PBDES, PCBS, PESTICIDES AND PAHS IN DUST	Todd Whitehead
1444	DEVELOPMENT OF SCREENING METHODS FOR FLUORINATED COATINGS OF FOOD CONTACT MATERIALS AND OTHER EVERYDAY COMMODITIES	Gerd Wolz
1114	CHROMATOGRAPHIC SEPARATION AND MASS SPECTROMETRIC FRAGMENTATION OF PERFLUOROCOMPOUNDS - OCCURRENCE OF CONGENERS AND ISOMERS IN THE ENVIRONMENT	Atsushi Yamamoto
1665	ANALYSIS METHOD OF PERFLUORINATED COMPOUNDS (PFCS) IN WASTE SAMPLES BY LC/MS/MS	Mihoko YOSHIDA
1222	SYNTHESIS OF BR5-BR7 META-HYDROXYATED/METHOXYLATED POLYBROMINATED DIPHENYL ETHERS	Kewen Zheng
1396	DECOMPOSITION OF PERFLUOROOCTANOIC ACID WITH ELECTROCHEMICAL OXIDATION METHOD	Qiongfang Zhuo

Sampling Strategies, Preparation and Quality Assurance Aspects of POPs Analysis

1318	NEW SOIL REFERENCE MATERIAL FOR DETERMINATION OF ORGANOCHLORINE COMPOUNDS FROM CHINA	Liang DONG
1074	DETERMINATION OF PBDES IN RIVER WATER AT I.R.S.A. CNR, MILANO, ITALY UTILIZING AUTOMATED SOLID PHASE EXTRACTION, GCMS/MS AND GC/ECD IN CONFORMANCE WITH EU STANDARDS	Michael Ebitson
1084	DETERMINATION OF SELECTED PERSISTENT ORGANIC POLLUTING PESTICIDES IN WATER USING AUTOMATED SPE AND GC/ECD	Michael Ebitson
1456	RAPID SAMPLE PREPARATION PROCEDURE FOR THE SIMULTANEOUS DETERMINATION OF PCBS, PBDES AND PAHS IN FISH	Jana Hajslova
1116	PURITY EVALUATION OF POTASSIUM PERFLUOROALKYLSULFONATE USING DIFFERENTIAL SCANNING CALORIMETRY	Nobuyasu Hanari
1242	TRIPLE QUAD GC-MS/MS TECHNIQUE FOR PCDD, PCDF, AND DL-PCB DETERMINATION IN MILK	Hans J. Huebschmann
1085	A DISSOLVED / PARTICULATE BASELINE STUDY OF PAH S (POLY- AROMATIC HYDROCARBONS) IN PARTICULATE LADEN WATER	Robert Johnson
1083	DETERMINATION OF PERSISTENT ORGANIC POLLUTING POLYCHLORINATED BIPHENYLS (PCB) CONGENERS IN WATER UTILIZING AUTOMATED SPE AND GC/ECD IN THE PARTS PER TRILLION RANGE	Robert Johnson
1296	RECENT AND UPCOMING ENVIRONMENTAL MATRIX STANDARD REFERENCE MATERIALS FOR ORGANOHALOGEN COMPOUNDS	John Kucklick
1609	AUTOMATED CLEAN UP METHOD FOR THE DETERMINATION OF THE PCSS AND PBDE IN FISH	Andrea Manni
1679	COMPARISON OF LIPID EXTRACTION FROM THE SERUM BY FOUR DIFFERENT METHODS	Junya Nagayama
1311	CONCENTRATION OF PER-FLUORINATED COMPOUNDS IN RIVER WATER IN TOKYO	Tetsuji Nishimura
1290	QA/QC - MEASURES FOR CONTINOUS MONITORING OF POPS IN BIOTA SAMPLES COLLECTED IN THE FRAME OF THE GERMAN ENVIRONMENTAL SPECIMEN BANK	Olaf Paepke
1206	SRMS FOR MONITORING HUMAN EXPOSURE TO ORGANIC CONTAMINANTS	Michele Schantz
1232	DEVELOPMENT OF CLEANUP METHOD OF DIOXIN-LIKE PCBS IN FISH BY FREEZING - LIPID FILTRATION	Jeoung Shin
1611	EVALUATION OF INTERLABORATORY STUDY ON PCDD, PCDF AND	Takumi TAKASUGA
1453	THE EQUALIZER: A FITNESS-FOR-PURPOSE TOOL	Yves Tondeur
1257	POLYCHLORINATED BIPHENYLS (PCBS) ANALYSIS CAPACITY DEVELOPMENT AND PCBS MONITORING IN ASIA	Bin Wang
1312	VINYL CHLORIDE PRODUCERS VOLUNTARY MONITORING PROGRAM - ANALYTICAL QA/QC PROGRAM	Michael Wilken

Brominated Compounds — Fate and Transport

1346	BROMINATED FLAME RETARDANTS IN VIETNAM: A CONCISE REVIEW OF RECENT CONTAMINATION	Nguyen Anh Tuan
1426	MEASUREMENT OF CURRENT USE FLAME RETARDANT CHEMICALS IN BIOSOLIDS	Elizabeth Davis
1464	GEOGRAPHIC VARIATION IN THE CONCENTRATIONS OF POLYBROMINATED DIPHENYL ETHERS (PBDES) AND METHOXYLATED PBDES IN SPERM WHALE (PHYSETER MACROCEPHALUS) BLUBBER	Sarah Eagle
1106	TEMPORAL TRENDS OF POLYCHLORINATED BIPHENYLS, POLYBROMINATED DIPHENYL ETHERS AND POLYCHLORINATED DIBENZO-P-DIOXINS AND DIBENZOFURANS IN RICE COLLECTED FROM AN E-WASTE DISMANTLING SITE AFTER CENTRALIZED RECYCLING IN SOUTHEAST CHINA	Jianjie Fu
1065	CAN BIOTRANSFORMATION OF BDE-209 CAUSE BIOACCUMULATION OF MORE TOXIC, LOWER BDES (E.G., BDE-47, -99) IN RAINBOW TROUT AND CARP OVER THE LONG TERM?	Nilima Gandhi
1314	DEVELOPMENT OF ENVIRONMENTAL FATE MODEL FOR HEXABROMOCYCLODODECANES (HBCDS) WITH ISOMERISATION PROCESS	Yasuhiro Hirai
1384	LEVELS OF PBDES AND SOME NOVEL BFRS IN GERMAN WADDEN SEA SEDIMENTS	Wilhelm Knoth
1020	SAMPLING AND ANALYSIS OF PBDE AND HBB IN AIR SAMPLES OF THE RHINE MAIN AREA, GERMANY	Wilhelm Knoth
1270	LEVELS AND TRANSPORT OF PBDES AND ALTERNATIVE BROMINATED FLAME RETARDANTS IN AIR AND SEAWATER FROM THE ARCTIC TO THE ANTARCTICA	Axel M ller
1591	BROMINATED DIPHENYL ETHERS (BDES) IN MARINE MAMMALS IN THE NORDIC ARCTIC DURING THREE DECADES (1986-2007)	Anna Rotander
1645	TRANSFER MECHANISMS OF POLYBROMINATED DIPHENYL ETHERS AND HUMAN EXPOSURE PATHWAYS: FOCUS ON INDOOR AND OTHER MICROENVIRONMENTS	Jianwen She
1451	PBDES, HBCD AND OTHER NON-PBDES FLAME RETARDANTS IN CAR DUST SAMPLED IN THE CZECH REPUBLIC IN 2009	Monika Stavelova
1231	CONCENTRATIONS OF PBDES, HBCDS AND TWO NOVELS OF BFRS IN ATMOSPHERE DERIVED BY PASSIVE AIR SAMPLER FROM VARIOUS LOCATIONS IN AND AROUND JAKARTA, INDONESIA	Agus Sudaryanto

Fluorinated Compounds — Fate and Transport

1487	PERFLUORINATED CHEMICALS IN FRESHWATER FISH IN CANADA	Amila De Silva
1618	TIME TRENDS OF PERFLUORINATED PHOSPHONIC ACIDS, POLYFLUOROALKYL PHOSPHORIC ACIDS, PERFLUORINATED CARBOXYLIC ACIDS AND PERFLUORINATED SULPHONIC ACIDS IN A SEDIMENT CORE FROM LAKE ONTATIO	Rui Guo
1543	Contamination of Perfluoralkyl acids and sulfonates in The Nile River System in Egypt	Anna K rrman
1469	Contamination of Perfluorinated Compounds in the River and Sea Water of Hyogo Pref., Japan	Chisato Matsumura
1610	COMPARISON OF OBSERVED AND ESTIMATED CONCENTRATIONS OF PERFLUOROOCTANE SULFONATE (PFOS) USING A FATE MODEL IN TOKYO BAY OF JAPAN	Yuichi Miyake
1682	TREND OF PFC CONCENTRATION IN THE TAMA RIVER, JAPAN	Takahiro Nishino
1637	EVALUATION OF SOURCES OF PERFLUORINATED COMPOUNDS IN UPPER MISSISSIPPI RIVER WATER USING POLYTOPIC VECTOR ANALYSIS	Paul Scott
1361	FACT-FINDING SURVEY ON PERFLUORINATED COMPOUNDS IN WASTEWATERS	Akihiro TAKAHASHI
1356	PERFLUORINATED COMPOUNDS IN ATMOSPHERE OF HYOGO PREFECTURE, JAPAN	Shusuke Takemine
1187	LEVEL AND DISTRIBUTION OF PERFLUORINATED COMPOUNDS IN RIVER WATER FROM SHENGYANG, CHINA	Nobuyoshi Yamashita
1321	NOVEL SOURCE APPORTIONMENT METHOD BASED ON GIS RECEPTOR MODEL FOR AQUATIC PERFLUORINATED COMPOUND (PFC) POLLUTION -A CASE STUDY IN THE BASIN OF TOKYO BAY, JAPAN-	Yasuyuki Zushi
1319	SURVEY OF PERFLUORINATED COMPOUND (PFC) POLLUTION IN THE BASIN OF TOKYO BAY USING THE SIMULTANEOUS ANALYSIS METHOD FOR 35 TYPES OF PFCS	Yasuyuki Zushi

Emerging and Naturally Occurring Compounds in the Environment

1619	LEVELS AND PROFILES OF DIOXIN-LIKE COMPOUNDS IN TWO FISH SPECIES FROM MEDITERRANEAN SEA	Gianfranco Brambilla
1249	THE PAH CALUX BIOASSAY AS A PROMISING IN VITRO TOOL FOR DETECTION AND MONITORING OF THE CARCINOGENIC POTENCY OF PAH MIXTURES	Abraham Brouwer
1039	PHOTOFORMATION OF TOXIC ORGANOBROMINATED COMPOUNDS IN THE SIMULATED SEAWATER	S. Chen
1640	A SURVEY OF POLYBROMINATED DIPHENYL ETHERS(PBDES) IN KOREAN INDUSTRIALIZED REGION	lg chun EOM
1638	LEVELS OF PERFLUORINATED COMPOUNDS(PFCS) IN KOREAN AQUATIC ENVIRONMENTS	lg chun EOM
1267	EMERGING HALOGENATED FLAME RETARDANTS IN PEREGRINE FALCON (FALCO PEREGRINUS) EGGS FROM CANADA AND SPAIN	Paula Guerra
1192	THE DRUG NAPROXEN AND ITS TRANSFORMATION PRODUCTS AS AN EXAMPLE FOR EMERGING ENVIRONMENTAL POLLUTANTS	Heinrich H hnerfuss
1088	DETERMINAION OF CARCINOGENIC PRIMARY AROMATIC AMINES ORIGINATED FROM AZO DYES IN COMMERCIAL TEXTILE PRODUCTS IN JAPAN	Tsuyoshi KAWAKAMI
1087	PHTHALIC ACID DIESTERS AND MONOESTERS IN HOUSEHOLD PRODUCTS IN JAPAN	Tsuyoshi KAWAKAMI
1209	ATRAZINE AND METOLACHLOR IN ONTARIO SMALL LAKES AND PRECIPITATION	Perihan Kurt-Karakus
1434	TRENDS AND EXPOSURE OF OH-PBDES, MEO-PBDES AND PBDDS IN BALTIC BIOTA	Karin L fstrand
1644	POP CHEMICAL ASSESSMENT IN THE FUTURE: EMERGING AND LEGACY COMPOUNDS IN THE PACIFIC ISLAND REGION	Vincent LAL
1510	THE ANALYSIS OF PERCHLORATE IN DAILY PRODUCT SAMPLES	Ji-Woo Lee
1475	CONCENTRATION OF DECHLORANE, DECHLORANE PLUS, DECHLORANES 602, 603 AND 604 IN MARINE ENVIRONMENT OF NORTHERN CHINA	Yi-Fan Li
1472	DECHLORANE PLUS, 602, 603 AND 604 IN CHINESE SURFACE SOIL	Yi-Fan Li
1520	PRESENCE OF UNKNOWN AND KNOWN FLUORINATED ORGANIC COMPOUNDS INCLUDING PFOS IN BIOLOGICAL SAMPLES FROM HONG KONG MAI PO TIDAL SHRIMP POND, CHINA	l Ha Loi
1071	SURVEY OF DIOXINS AND DIOXIN-LIKE COMPOUNDS IN ANIMAL FEED IN POLAND	Jadwiga Piskorska- Pliszczynska
1043	POLYCYCLIC MUSKS IN NIST STANDARD REFERENCE MATERIALS	Jessica Reiner
1175	LEVELS OF FLAME RETARDANTS, PCBS, AND SELECTED ORGANOCHLORINE PESTICIDES IN TREE BARK VS. LEVELS IN AIR AND PRECIPITATION	Amina Salamova
1488	STUDY ON POLLUTION SITUATION OF PCDD/FS ON URBAN DIFFERENT FUNCTIONAL DISTRICTS	Yehong Shi

Emission Control

1133	THERMAL DECOMPOSITION AND EMISSION CONTROL OF DIOXINS DURING THE MANUFACTURING PROCESS OF CERAMISITE FROM MUNICIPAL SOILD WASTE INCINERATION FLY ASH	Zhang Haijun
1411	FORMATION AND BEHAVIOR OF POLYCHLORINATED DIBENZOFURANS IN INDIRECT HEATING TREATMENT OF DIOXINS- CONTAMINATED SEDIMENT	Masaaki Hosomi
1172	FORMATION OF PCDD:S AND PCDF:S DURING CO-COMBUSTION OF BIOFUELS WITH REST PRODUCTS FROM PULP AND PAPER INDUSTRY	Stina Jansson
1233	SUPPRESSION OF PCDD/FS FORMATIONS ON THE COMBUSTION PROCESS BECAUSE OF THE PRESENCE OF CO-EXISTENT ORGANIC COMPOUNDS	Tomohiro Kishi
1596	PCDD/F REMOVAL WITH CATALYTIC FILTERS IN A MUNICIPAL SOLID WASTE INCINERATOR	Karl Mair
1641	ASSESSING UNCERTAINTIES FOR PCDD/F NATIONAL INVENTORY IN MEXICO	Pablo Maiz
1282	ZEOLITES AS SELECTIVE ADSORBENTS FOR EMISSION CONTROL OF DIOXIN - ADSORPTION STUDIES IN LIQUID PHASE	Maud Mercury



Global Fate & Long Range Transport

1482	DIOXIN ACCUMULATION IN DEEP-SEA MEGAFAUNA (BLANES SUBMARINE CANYON, NW MEDITERRANEAN)	ESTEBAN ABAD
1243	CHARACTERISTICS OF DIOXIN-LIKE COMPOUNDS IN LEACHATES FROMLANDFILLS CONTAINING INCINERATION RESIDUES IN TAIWAN	Tsai Chang-Lan
1225	VARIATION OF AMBIENT PCDD/F CONCENTRATION IN NORTHERN TAIWAN DURING THE WINTER MONSOON EPISODE	Kai Hsien Chi
1329	INFLUENCE OF CHAIN LENGTH AND CHLORINATION DEGREE ON THE OCTANOL-WATER-PARTITION COEFFICIENTS OF POLYCHLORINATED N-ALKANES	Mehmet Coelhan
1330	OCTANOL-WATER-PARTITION COEFFICIENTS OF INDIVIDUAL CHLORO N-ALKANES	Mehmet Coelhan
1529	AN OVERVIEW OF TEMPORAL TRENDS OF LEGACY AND EMERGING CONTAMINANTS IN THE ARCTIC AND POSSIBLE IMPLICATIONS FOR TOP PREDATORS AND HUMANS	Cynthia de Wit
1537	POLYCYCLIC MUSKS INDOORS AND OUTDOORS	Miriam Diamond
1347	COMPARISON OF PERSISTENT ORGANOHALOGENATED POLLUTANTS IN FEATHERS FROM NESTLING AND ADULT PREDATORY BIRDS FROM NORTHERN NORWAY	lgor Eulaers
1064	UNCERTAINTY ANALYSIS OF THE GLOBAL DYNAMICS OF POLYCHLORINATED BIPHENYLS USING A BAYESIAN EMULATOR OF THE FINELY-ADVANCED TRANSBOUNDARY ENVIRONMENTAL MODEL (FATE)	Itsuki Handoh
1573	URBAN TRIBUTARY CONTAMINANTS: CONCENTRATIONS AND MASS FLOWS OF PCBS, PBDES, PAHS, POLYCYCLIC MUSKS	Paul Helm
1050	POP FINGERPRINTS IN ALPINE SPRING WATER	Bernhard Henkelmann
1108	FATE OF THE POLYCHLORINATED BIPHENYLS IN THE GLOBAL OCEANS PREDICTED BY THE FINELY-ADVANCED TRANSBOUNDARY ENVIRONMENTAL MODEL (FATE)	Toru Kawai
1216	TRANSBOUNDARY CONTAMINATION BY MIREX AND TOXAPHENE: THEIR PRESENCE IN JAPANESE SEAWATER AND ACCUMULATION IN JAPANESE COMMON SQUID (TODARODES PACIFICUS)	Masahide Kawano
1058	PHOTOCHEMISTRY OF DIBENZYL KETONES TO STUDY BIMOLECULAR REACTIONS IN SNOW	Romana Kurkova
1407	PERSISTENT ORGANIC POLLUTANTS IN THE ARCTIC AND CANADA S NORTHERN CONTAMINANTS PROGRAM (NCP)	Perihan Kurt-Karakus
1082	POPS (PCBS AND ORGANOCHLORINE PESTICIDES) IN FAT FROM TROPICAL DETRITIVOROUS FISH (PROCHILODUS SP.) FROM BRAZIL - THE "FISH-WATCH" APPROACH	Joao Paulo Machado Torres
1332	THE SEA WATER CONCENTRATION AND ENANTIOMERIC FRACTION OF HCHS IN THE SEAS AROUND JAPAN	Suzuki Motoharu
1430	24 POPS - COMPREHENSIVE ANALYSIS OF ALL STOCKHOLM CONVENTION AND CANDIDATE POPS IN COD LIVER AND SALMON	Frank Neugebauer
1499	SOURCES, FATE AND LOADINGS OF PCBS, PBDES, PAHS AND SYNTHETIC MUSKS FROM THE GREATER TORONTO AREA	Matthew Robson
1504	FATE AND CONCENTRATIONS OF COMPOUNDS RELATED TO DECHLORANE PLUS IN A LAKE ONTARIO (CANADA) FOOD WEB	Ed Sverko
1221	POLYCHLORINATED BIPHENYLS IN THE SURFACE WATER AND ATMOSPHERE OF NANTONG CITY, JIANGSU PROVINCE, CHINA	Lifei Zhang
1156	ALTITUDINAL DISTRIBUTION OF PCBS AND PBDES IN SOILS ALONG BALANG MOUNTAIN, SOUTHWEST CHINA	Xiaoyan Zheng

POPs in Soil and Sediment

1135	THE CONSEQUENCES OF OIL AND MILITARY TECHNOGENESIS IN THE CHECHEN REPUBLIC, RUSSIA. II. PCDD/FS AND PCBS-WHO POLLUTION OF SOILS	Zarema Amirova
1057	ANALYSIS ON PCDD/FS IN SOIL AROUND WASTE INCINERATION PLANTS IN CHINA USING CALUX ASSAY WITH HRGC/HRMS	Yingzhe Du
1055	VARIATION OF PCDD/FS LEVELS IN SOIL AROUND A HOSPITAL WASTE INCINERATOR: BEFORE AND AFTER THREE YEARS OPERATION	Yingzhe Du
1274	DIOXIN LEVELS IN GRAZING LAND AND GROUNDWATER IN THE SURROUNDINGS OF A LARGE INDUSTRIAL AREA IN TARANTO (ITALY)	Vittorio Esposito
1381	DETERMINATION OF POLYBROMINATED BIPHENYLS (PBB) IN BALTIC SEA SEDIMENTS FROM THE GULF OF GDANSK, PL	Adam Grochowalski
1336	A NATIONWIDE SURVEY OF DIOXINS IN KAOLIN CLAYS FROM JAPAN	Yuichi HORII
1230	CONCENTRATIONS OF PCDD/FS AND PCBS IN DATED SEDIMENT CORES AND SURFACE WATER OF THREE RURAL LAKES, SOUTHWEST OF CHINA	Jun Huang
1260	THE LEVEL OF DIOXIN-LIKE PCBS IN SOIL OF BEIJING	Jun Jin
1375	THE LEVEL OF ORGANOCHOLRINE PESTICIDES IN SOIL OF BEIJING	Jun Jin
1224	DEPOSITION AND SINK OF PCDD/FS IN A HIGH-MOUNTAIN LAKE IN CENTRAL TAIWAN	Shuh Ji Kao
1671	PESTICIDES (OPPS & OCPS) AND HERBICIDES IN SEDIMENTS FROM CANALS AND DRAINS	Bhupander Kumar
1627	EVALUATION OF PCDDF CONTENT IN RECYCLED PAPER SLUDGE	Silvia Mosca
1517	CHLOROPHENOLS AND PCCD/FS DURING SEWAGE SLUDGE COMPOSTING	Maria MU OZ
1151	ASSESSMENT OF DDT AND ITS METABOLITES LEVELS IN SOIL AND DUST SAMPLES FROM CHIAPAS, MEXICO.	IVAN NELINHO PEREZ-MALDONADO
1481	CONTRIBUTION OF BFRS AND OTHER CONTAMINANTS TO TOXICITY PROFILES OF THE CZECH RIVER SEDIMENTS AND SEWAGE SLUDGE	Jana Pulkrabova
1518	A STUDY OF POLYCHLORINATED BIPHENYLS IN AN UNCONTROLLED E-WASTE RECYCLING SITE AND THE AMBIENT ENVIRONMENT	Mingzhong Ren
1556	PBDES IN NEWARK BAY SEDIMENTS	Daniele Staskal Wikoff
1429	APPLICATION OF PRINCIPAL COMPONENTS ANALYSIS AND SEQUENTIAL GAUSSIAN SIMULATION TO A COMPREHENSIVE SOIL SAMPLING DATASET TO PREDICT PCDD/F CONCENTRATIONS IN MIDLAND, MI	John Andrew Tachovsky
1345	DISTRIBUTION CHARACTERISTICS OF PCBS IN CORE SEDIMENT FROM DIANCHI LAKE, CHINA	Xing Wan
1068	STUDY OF DISTRIBUTION PATTERNS AND CONCENTRATIONS OF SHORT CHAIN CHLORINATED PARAFFINS IN FARM SOILS IRRIGATED WITH WASTEWATER	Lixi Zeng



POPs in the Environment

1410	LEVELS OF DIOXIN AND FURANS IN PM10 OF AMBIENT AIR IN MANIZALES, COLOMBIA	Beatriz Helena Aristizabal Zuluaga
1419	AIR EMISSIONS OF POLYBROMINATED DIOXINS, FURANS AND BIPHENYLS FROM INDUSTRY IN THE FLEMISH REGION OF BELGIUM	Martine Blondeel
1205	BACKGROUD LEVELS AND SEASONAL VARIATION OF POPS IN SPANISH ATMOSPHERE	Miguel Angel Concejero
1628	DIOXINS AND FURANS IN THE AIR OF A MEDIUM-SIZE BRAZILIAN CITY AFFECTED BY SUGARCANE PRE-HARVESTING BURNING	Joao Vicente De Assuncao
1498	MEASUREMENTS OF PCDD AND PCDF CONCENTRATIONS IN WILD-CAUGHT AND FARM-RAISED SHRIMP FROM THE U.S. RETAIL MARKET	Dimitri Fillos
1624	TEQ CALCULATIONS AND DAILY INTAKE ESTIMATES ASSOCIATED WITH PCBS IN SHRIMP FROM THE U.S. RETAIL MARKET	Dimitri Fillos
1121	ACCUMULATION OF POLYCHLORINATED DIBENZO-P-DIOXINS, DIBENZOFURANS AND DIOXIN-LIKE POLYCHLORINATED BIPHENYLS IN BULL FROGS (RANA CATESBEIANA) FROM THE BASINS OF MAJOR RIVERS IN KOREA DURING 2002-2004	gi ho jeong
1115	COMPARISON OF PERSISTENT ORGANIC POLLUTANTS LEVELS IN FRESHWATER FISH (CRUCIAN CARP) BETWEEN KOREA AND JAPAN	GI HO JEONG
1364	SEASONAL AND SPATIAL DISTRIBUTION OF DIOXIN AND DIOXIN LIKE PCBS IN AMBIENT AIR OF BUSAN, SOUTH KOREA	Tae-Uk JEONG
1183	DISTRIBUTION OF ATMOSPHERIC PCDD/FS AND COPLNR-PCBS IN REPUBLIC OF KOREA	Young Yeul Kang
1184	THE RESULT OF NATIONAL WIDE SURVEY ON ORGANOCHLORINE PESTCIDES IN KOREA ATMOSPHERE	Woo II Kim
1357	SEASONAL CHARACTERISTICS OF ORGANOCHLORINE PESTICIDES IN KOREAN AMBIENT AIR	So-young Kwon
1305	POPS IN PONTOPORIA BLAINVILLE (FRANCISCANA DOLPHIN) FROM BRAZILIAN COAST: PAST, PRESENT AND FUTURE TRENDS	Juliana Leonel
1198	DETERMINATION OF METHOXYLATED POLYBROMINATED DIPHENYL ETHERS IN BIVALVE SAMPLES COLLECTED FROM BOHAI BAY, CHINA	Jiyan Liu
1569	PREDICTING SEASONAL INDOOR PCB CONCENTRATIONS BASED ON FUNDAMENTAL EQUATIONS	Taeko Minegishi
1360	ACCUMULATION FEATURES OF PCBS AND HYDROXYLATED METABOLITES	Hazuki Mizukawa
1577	LEVELS OF POLYCHLORINATEED DIBENZO-P-DIOXINS AND DIBENZOFURANS IN FOOD OF ANIMAL ORIGIN COLLECTED FROM THE CONTAMINATED SITES OF ELOOR, KOCHI, SOUTH INDIA	Anbu Munusamy
1497	PRINCIPAL COMPONENTS ANALYSIS (PCA) OF PCB CONCENTRATIONS IN SHRIMP FROM THE U.S. RETAIL MARKET	Paul Scott
1090	SPATIAL AND TEMPORAL TRENDS OF PERSISTENT ORGANIC POLLUTANTS IN AMBIENT AIR FROM THE AIR POLLUTION MONITORING NETWORK OF THE GERMAN FEDERAL ENVIRONMENTAL AGENCY	Christian Temme
1327	SURVEY OF PERFLUORINATED ALKYL ACIDS IN SELECTED BIOTA FROM HOMEBUSH BAY, SYDNEY AUSTRALIA	Jack Thompson
1338	CALIBRATION AND FIELD SURVEY OF PASSIVE AIR SAMPLERS FOR PERSISTENT ORGANIC POLLUTANTS	Masahiro Tsurukawa
1253	PERSISTENT ORGANIC POLLUTANTS IN HARBOUR PORPOISE CALVES FROM 1990 UNTIL 2008: YOUNG WILDLIFE AT RISK?	Liesbeth Weijs
1648	PARTICLE-BOUND PCDD/FS IN THE ATMOSPHERE OF AN ELECTRONIC WASTE DISMANTLING AREA IN CHINA	Sheng Wen
1479	LEVELS, COMPOSITIONAL PROFILES, AND SEASONAL VARIATION OF DECHLORANE PLUS IN AIR OF DALIAN, A NORTHEASTERN CHINESE CITY	Meng Yang
1325	DECHLORANE PLUS IN IN- AND OUTDOOR AIR OF AN URBAN CITY IN SOUTHERN CHINA	Zhiqiang Yu
1392	PBDES ATMOSPHERIC CONCENTRATION AND CONGENER PROFILE IN NANTONG, A CITY AT YANGTSI RIVER DELTA, CHINA	Ting Zhang
1040	VARIATIONS OF ATMOSPHERIC POLYCHLORINATED DIBENZO-P- DIOXINS AND POLYCHLORINATED FURANS BEFORE AND DURING BEIJING OLYMPIC GAMES	Qinghua Zhang
1320	SOURCE APPORTIONMENT OF SUSPENDED PARTICULATE MATTER AEROSOL USING US EPA PMF 3.0	Yasuyuki Zushi

Sources of POPs

1575	PCDD/F, PCB AND HCB EMISSIONS FROM RURAL WOOD STOVES: A CASE STUDY FROM MEXICO	Beatriz Cardenas
1132	PAHS, NITRO-PAHS AND DIESEL EXHAUST TOXINS IN THE GREAT LAKES	Sergei Chernyak
1204	PCDD/FS, DL-PCBS, HCB AND PAHS EMISSIONS IN SECONDARY ALUMINUM CASTING PLANTS: EVALUATION IN THE FRAME OF SPANISH DIOXIN INVENTORY	Miguel Angel Concejero
1056	PLASMA-INDUCED DESTRUCTION OF GAS PHASE 1, 2-DICHLOROBENZENE	Yingzhe Du
1403	FOOD SOURCES OF NON DIOXIN-LIKE PCBS (NDL-PCBS)	Arvid Fromberg
1466	ARE NON-FOOD SOURCES IMPORTANT FOR THE HUMAN EXPOSURE TO BISPHENOL-A?	Tinne Geens
1237	Congener Distribution and Pattern Ratio of Polychlorinated Biphenyls in Transformer oil Using GC/ ECD	Kil-Hwan Hong
1368	MONITORING POPS IN PACIFIC REGION: A CASE STUDY FOR OCDD CONTAMINATION IN FIJI ISLANDS	Vincent LAL
1157	CHARACTERISTICS OF PCDD/FS EMISSION IN FLY ASH FROM IRON FOUNDRIES	Pu Lv
1342	STUDY AND DIFFERENTIATE DIOXIN FROM HERBICIDE USED IN VIETNAM WAR AND THAT CREATED FROM OTHER WASTES	Truong NGHIEM
1477	EMISSION OF PCDD/FS FROM DOMESTIC COMBUSTION USING VARIOUS WOODS, BIOFUEL AND COALS	Tomas Ocelka
1374	DIOXIN EMISSIONS FROM FOREST FIRES	John Schaum
1335	IDENTIFICATION OF DIOXIN RELATED COMPOUNDS BY COMBINED IN VITRO BIOASSAY/ CHEMICAL ANALYSIS: MONITORING STUDY FOR ASIAN COASTAL WATERS USING BIVALVES AS BIOINDICATORS	Masayuki Someya
1199	EMISSION PARTITIONING AND DESTRUCTION EFFICIENCY OF PCBS DURING INCINERATION OF WASTES CONTAINING PCBS	Geum-Ju Song
1078	DIOXIN PHOTOPRODUCTS OF TRICLOSAN AND ITS CHLORINATED DERIVATIVES IN SEDIMENT CORES	Charles Sueper
1150	EFFECT OF NON-STATIONARY COMBUSTION PHASES ON EMISSION FACTORS OF SELECTED POLLUTANTS AND PCDD/F FROM DOMESTIC COMBUSTION	Michal Syc
1559	INDENTIFICATION OF PCDD/PCDF AND DIOXIN-LIKE PCB IMPURITY IN CHINESE PESTICIDES	Tingting Zhang
1486	INFLUENCE OF PESTICIDE ON THE FORMATION OF PCDD/PCDF FROM OPEN BURNING OF CORN STRAW	Tingting Zhang
1180	LEVELS AND TRENDS OF PCDD/FS IN SEWAGE SLUDGE OF URBAN WASTE WATER TREATMENT PLANTS	Bing Zhang

Human Exposure to Brominated Compounds

1096	EXPOSURE ASSESSMENT OF NOVEL BROMINATED FLAME RETARDANTS IN BELGIAN HOME AND OFFICE DUST			
1549	PBDES AND NON-PBDES IN AIRCRAFT CABIN AND COCKPIT AIR AND DUST	ke Bergman		
1530	SERUM CONCENTRATIONS OF POLYBROMINATED DIPHENYL ETHERS AND OTHER PERSISTENT ORGANOHALOGEN COMPOUNDS IN THE UNITED STATES POPULATION: 2001-2002	Emily Edenfield		
1080	ANALYSIS OF PBDES, PCBS, ORGANOCHLORINE PESTICIDES, AND NEW BFR ALTERNATIVES IN CALIFORNIA PREGNANT WOMEN BY HIGH RESOLUTION MASS SPECTROMETRY	Weihong Guo		
1323	POPLYBROMINATED DIPHENYL ETHERS IN HUMAN SERUM FROM TWO URBAN CITIES IN KOREA	Jung-Ho Kang		
1273	DIETARY INTAKE OF POLYBROMINATED ETHERS IN DIFFERENT AREAS IN CHINA	jingguang Li		
1676	BROMINATED FLAME RETARDANTS IN HUMAN BREAST MILK AND HOUSE DUST FROM THE PHILIPPINES: IMPLICATIONS FOR HUMAN EXPOSURE	Govindan Malarvannan		
1623	HIGH LEVELS OF PBDES IN 4% OF BLOOD SAMPLES FROM AN ELDERLY SWEDISH POPULATION	Lisa Mattioli		
1612	A COMPARATIVE STUDY OF HUMAN HEALTH RISKS POSED BY A FLAME RETARDED CURTAIN WITH HEXABROMOCYCLODODECANE (HBCD)	Yuichi Miyake		
1607	NEWLY DIOXIN RELATED COMPOUNDS (POLYBROMINATED CHLORINATED BIPHENYLS, DIBENZO-P-DIOXINS AND DIBENZOFURANS) IN FOODS FROM THE JAPANESE MARKETPLACE	Teruyuki Nakao		
1608	LEVELS OF PERSISTENT ORGANIC POLLUTANTS (POPS) IN DOMESTIC FOODS AND IMPORTED FOODS FROM JAPANESE MARKETPLACE	Souichi Ohta		
1289	Contamination of US Butter and updated estimate of PBDE Dietary intake	Olaf Paepke		
1016	DOES FLYING IN COMMERCIAL AIRLINERS PRESENT A THREAT OF PBDE EXPOSURE?	Arnold Schecter		
1636	PRELIMINARY EVALUATION OF TISSUE CONCENTRATIONS OF POLYBROMINATED DIPHENYL ETHERS (PBDES) IN WILD-CAUGHT WALLEYE (SANDER VITREUS) FROM CANADA	Laura Scott		
1240	DIETARY EXPOSURE TO PBDES IN KOREA	Jung Ju Seo		
1501	U.S. TODDLER S EXPOSURE TO FLAME RETARDANT MIXTURES: ASSOCIATIONS BETWEEN HAND WIPE RESIDUES AND HOUSE DUST	Heather Stapleton		
1197	SYNTHESIS AND IDENTIFICATION OF BR7-BR9 OH/MEO-PBDES IN HUMAN SERUM	Kewen Zheng		

Human Exposure to Fluorinated Compounds

1594	DECLINE OF PERFLUOROOCTANOIC ACID IN HUMAN SERUM OVER TWO YEARS BEFORE AND AFTER GRANULAR ACTIVATED CARBON FILTRATION IN TWO PUBLIC WATER SUPPLIES, AND IMPLICATIONS FOR HALF-LIFE ESTIMATION	Scott Bartell
1621	RETROSPECTIVE AND PROSPECTIVE INTAKE ASSESSMENT OF PERFLUORINATED CHEMICALS WITHIN THE EUROPEAN UNION: THE PERFOOD PROJECT	Gianfranco Brambilla
1173	INVESTIGATION OF THE OCCURRENCE OF PERFLUOROOCTANOIC ACID AND PERFLUOROOCTANE SULFONATE IN UNTREATED SOURCE AND FINISHED DRINKING WATER IN CANADA	Cariton Kubwabo
1079	USE OF A SIMPLE PHARMACOKINETIC MODEL TO ESTIMATE EXPOSURES TO PERFLUORINATED COMPOUNDS	Matthew Lorber
1631	SELECTED PREDICTOR VARIABLES OF TOTAL SERUM POLYCHLORINATED BIPHENYL LEVELS IN THE GENERAL U.S. POPULATION 2003-2004	Cheryl McClure
1425	TRENDS IN SERUM PFC CONCENTRATIONS IN THE MID-OHIO VALLEY POPULATION	Debapriya Mondal
1072	PCDD, PCDF AND DL-PCB NATIONAL FOOD SURVEY IN POLAND	Jadwiga Piskorska- Pliszczynska
1158	POLY- AND PERFLUORINATED COMPOUNDS IN HOUSEHOLD CONSUMER PRODUCTS	Karl-Werner Schramm
1341	DECLINE IN PFOS AND PFOA SERUM CONCENTRATIONS IN AN AUSTRALIAN POPULATION FROM 2002 TO 2009	Jack Thompson
1431	EXPOSURE OF NORWEGIAN INFANTS TO PERFLUORINATED COMPOUNDS	Cathrine Thomsen
1191	EU-WIDE ENVIRONMENTAL AND EXPOSURE MONITORING OF DIOXINS, PCBS AND OTHER PERSISTENT ORGANIC POLLUTANTS (POPS) IN BUTTER AND CORRELATIONS TO PUBLISHED AIR DATA	Gunther Umlauf
1302	ANALYSIS OF PERFLUORINATED COMPOUNDS IN BLOOD SERUM BY SUPRAMOLECULAR SOLVENT-BASED MICROEXTRACTION AND LIQUID CHROMATOGRAPHY/ION ISOLATION-BASED ION TRAP MASS SPECTROMETRY	Stefan van Leeuwen
1496	LEVELS OF PERFLUORINATED CARBOXYLIC ACIDS (PFCA), PERFLUORINATED SULFONIC ACIDS (PFSA), AND FLUORINATED TELOMERS (FTOH) IDENTIFIED IN PAPER-BASED FOOD CONTACT MATERIALS FROM THE GERMAN MARKET	Gerd Wolz

Human Exposure to Dioxins and PCBs

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1532	LEVELS AND TEMPORAL TRENDS OF PCDD/FS AND PCBS ESTEBAN AF IN GENERAL POPULATION LIVING NEAR AN URBAN WASTE TREATMENT PLANT, 1995-2008				
1398	LEVELS OF PERSISTENT ORGANIC POLLUTANTS (POPS) IN HUMAN BREAST MILK SAMPLES FROM GHANA	Sam Adu-Kumi			
1420	ENVIRONMENTAL FATE AND HUMAN HEALTH RISKS OF LINDANE IN GHANA	Sam Adu-Kumi			
1144	ORGANOTIN INTAKE THROUGH FISH CONSUMPTION IN FINLAND	Riikka Airaksinen			
1376	SERUM CONCENTRATIONS OF DIOXINS AND DIOXIN-LIKE COMPOUNDS AMONG RUSSIAN BOYS AND THEIR MOTHERS: THE ROLE OF BREASTFEEDING	Larisa Altshul			
1134	THE CONSEQUENCES OF OIL AND MILITARY TECHNOGENESIS IN THE CHECHEN REPUBLIC, RUSSIA. I. PCDD/FS AND PCBS IN BIOLOGICAL TISSUES OF HUMANS AND FOOD STUFF	Zarema Amirova			
1554	PCDD/F AND DIOXIN-LIKE PCB TEO REFERECNCE RANGES, TEMPORAL TRENDS, AND DEMOGRAPHIC COMPARISONS FROM 1999-2004	Buddy Burkhalter			
1140	EXPLORATION OF CUSHION FOAM CORE SAMPLES TO ASSESS HISTORICAL RESIDENTIAL EXPOSURE TO PESTICIDES	David Camann			
1176	EVALUATION OF POSSIBLE PCDD/F, DIOXIN LIKE PCB AND PAH CONTAMINATION IN OLIVE AND OLIVE OIL SAMPLES FROM AREAS AFFECTED BY THE FIRES IN SUMMER 2007 IN GREECE	Danae Costopoulou			
1044	A QUANTITATIVE METHOD FOR POLYCHLORINATED DIOXIN/FURAN CONGENER SOURCE COMPARISONS	Robert Cox			
1633	SELECTED PREDICTOR VARIABLES OF FOUR ORGANOCHLORINE PESTICIDE OR THEIR METABOLITE LEVELS IN THE GENERAL U.S. POPULATION 2003-2004	Emily DiPietro			
1646	PHYSIOLOGICALLY BASED PHARMACOKINETIC MODELING (PBPK) AS A TOOL FOR PREDICTING TCDD BLOOD CONCENTRATION IN WOMEN LIVING NEAR SEVESO	Claude Emond			
1316	ANALYSIS OF DDT AND ITS METABOLITES IN HUMAN CORD BLOOD IN NEPAL	Takashi ERIGUCHI			
1248	DIOXIN LEVELS IN EUROPEAN EELS, A BELGIAN STUDY	Jean-Francois Focant			
1468	THE UNIVERSITY OF MICHIGAN DIOXIN EXPOSURE STUDY OUTLIER INVESTIGATIONS: MAIN RESULTS AND LESSONS LEARNED	Alfred Franzblau			
1279	HUMAN BODY DISTRIBUTION IN ADIPOSE TISSUE, BRAIN AND LIVER OF SOME EMERGING PHENOLIC CONTAMINANTS	Tinne Geens			
1570	FOOD PREDICTORS OF SERUM DIOXIN CONCENTRATION IN BACKGROUND POPULATIONS: SAMPLES FROM TWO MICHIGAN COUNTIES AND THE U.S. NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES)	Brenda Gillespie			
1171	EXPOSURE ASSESSMENT OF WORKERS TO PCDD/FS, PCBS AND PAHS AT A SINTER PLANT IN THE UK	Kevin Jackson			
1550	THE UNIVERSITY OF MICHIGAN DIOXIN EXPOSURE STUDY: ASSOCIATIONS OF FISH AND GAME INTAKE WITH HUMAN SERUM DIOXIN CONCENTRATIONS	Xiaohui Jiang			
1616	CONCENTRATIONS OF YUSHO RELATED POLYCHLORINATED BIPHENYLS AND POLYCHLORINATED DIBENZOFURANS IN BLOOD OF YUSHO PATIENTS	Jumboku KAJIWARA			
1606	CONTAMINATION LEVELS OF DIOXINS AND PAHS IN THE SAMPLES OF HAIR AND CIGARETTE	Hideki Kakutani			
1239	RESIDUAL CHARACTERISTICS OF PBDES,HCB,PCDD/FS,AND DL-PCBS IN RAW BOVINE MILK AND PREDICTED DIETARY EXPOSURE IN KOREA	Dong-Gyu Kim			
1639	PCDD/F AND DIOXIN-LIKE PCB IN HUMAN MILK FROM POLAND - PART I	Danuta Ligocka			
1634	The First Polish Survey study of Human Milk For Pops - Capacity Building. EEA Financial Mechanism Grant Plo074	Danuta Ligocka			
1622	DETAILED ISOMER PROFILE OF PCB FOR HUMAN BLOOD	Toru Matsumura			
1680	THE SURVEY ON THE ACCUMULATOIN OF DIOXINS IN HUMANS (?) - A DIOXIN CONCENTRATION OF GENERAL ENVIRONMENTAL INHABITANTS IN JAPAN AND INTALE SURVEY FROM FOOD -	Toru Matsumura			
1228	NATIONAL STUDY ON POLYCHLORINATED BIPHENYL LEVELS IN BLOOD OF FRENCH FRESHWATER FISH EATERS	Mathilde Merlo			
1630	PRESENCE OF DIOXINS IN MILK MARKETED IN MONTERREY, NUEVO LE N, MEXICO	Lidia Naccha			
1599	PCBS IN WHOLE BLOOD AND SERUM OF A CHICAGO POPULATION	Uyen Nguyen			
1598	STATISTICAL COMPARISONS OF PCB NHANES DATA FROM 1999- 2000, 2001-2002, AND 2003-2004	Uyen Nguyen			
1668	DATA COMPARABILITY BETWEEN BIOMONITORING STUDIES FOR PCDD/FS - ISSUES FOR THE USE OF THE NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES) DATA	Donald Patterson			

1052	ASSESSMENT OF POLYCHLORINATED BIPHENYLS AND MERCURY LEVELS IN SOIL AND BIOLOGICAL SAMPLES FROM SAN FELIPE, NUEVO MERCURIO, ZACATECAS, MEXICO	IVAN NELINHO PEREZ-MALDONADO
1062	PERSISTENT ORGANIC POLLUTANTS IN CALIFORNIA WOMEN: A BASELINE FOR THE CALIFORNIA BIOMONITORING PROGRAM	Myrto Petreas
1620	THE TYNE FISH PROJECT - CONCENTRATIONS OF DIOXINS (PCDD/F) AND PCBS IN DIFFERENT FISH SPECIES AND SAMPLE TYPES FROM THE TYNE RIVER ESTUARY, UK, WITH DIETARY INTAKE ESTIMATES FOR ANGLERS	Martin Rose
1029	CONTAMINATION OF U.S. FOOD WITH BPA	Arnold Schecter
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附件二

DETERMINATION OF PCDDs/DFs/DL-PCBs IN DUCK EGG, SALTED DUCK EGG AND CENTURY EGG SAMPLES BY THE DR CALUX[®] BIOASSAY

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Introduction

In 2005, a university researcher in Taiwan identified high concentrations of dioxins in duck eggs, and authorities admitted that the level of dioxins found in the duck eggs was much higher than maximum level of dioxins permitted by the EU (3.0 pg WHO-TEQ (PCDD/F) /g fat). The incident triggered public anxiety and uncertainty about the safety of duck meat and duck eggs. The market was severe affected. To stabilize the prices and bring order back into the market, approximately twenty thousand ducks, and 1.27 million duck eggs destroyed, and the market for duck eggs was closed for more than 2 weeks. According to official statistics, more than 90% of duck eggs produced in Taiwan are processed into preserved eggs, with 40% of these as *century egg* (Peedan) and 60% as *salte duck egg*. Both of these varieties of preserved egg are unique to Chinese cuisine. In order to prevent similar dioxin contamination from happening again, we tested the DR CALUX[®] bioassay to screen and monitor duck eggs and the products produced with them.

Material and method:

Sample collection:

Two samples with known dioxin levels were obtained from a national university. One of the samples was salted duck egg and the other was century egg. These were to be used as a reference, because the total concentration of PCDDs/DFs had been determined by the HRGC/MS. Two certified reference materials (CRMs), one fish oil sample and one feed sample, were purchased from BioDetection Systems. Between 2008 and 2009, 8 duck egg samples and 16 salted duck egg samples were collected from duck farms, supermarkets, and vendors. All samples were homogenized immediately after collection and stored at -20° C until use.

DR CALUX bioassay:

The DR CALUX[®] bioassay has been widely used for its sensitivity in the detection of dioxin and dioxin-like compounds (PCDDs/DFs and dioxin-like PCBs) in various materials.¹⁻³ The DR CALUX bioassay was performed in strict adherence to the instructions set out by DR CALUX[®] bioassay.³ A sample of approximately 6-10 grams of homogenized egg samples was mixed with water and isopropanol, and extracted with hexane/diethyl ether (97/3) three times. The extract was evaporated by nitrogen gas to a small volume and then passed through a sulfuric acid activated silica column, where it was eluted with a mixture of hexane/diethyl ether (97/3). The eluate, which contained dioxins and dioxin-like compounds, was collected, evaporated until dry, and re-dissolved in 25 μ L DMSO. It was mixed with culture medium and applied to the H4IIE cells containing an AhR-DRE-regulated luciferase gene-carrying plasmid. After 23 h, the luciferase was released from the cells and the levels of dioxins determined. For quality control, one CRM was included in each test

series. The procedure for the DR CALUX bioassay is described in more detail in the appendix.⁴

Results and Discussion:

Bioassay results of reference materials- one salted-duck egg and century egg sample

The fat content of the salted egg and century egg samples was $14.5\% \pm 0.8\%$ and $9.3\% \pm 0.7\%$. According to the data provided with the two reference materials (based on the HRGC/MS analysis), the salted duck egg and samples contained 0.612 pg WHO₉₈PCDD/PCDF-TEQ/g century egg fat and 0.728 pg WHO₉₈PCDD/PCDF-TEQ/g fat, respectively. In the three initial bioassays, (two repeated for each bioassay), the DR CALUX[®] bioassay determined that the salted duck egg sample contained 4.36 \pm 0.56 pg DR CALUX-TEQ/g fat. These results were much higher than the 3 pg WHO₉₈PCDD/PCDF-TEQ/g fat, maximum level of dioxins permitted for eggs in Taiwan. We decided to modify the sample weight, and added one clean-up acid-silica column for the DR CALUX[®] bioassay. The result of this test showed a reduction to 1.30 ± 0.29 pg (0.89-1.53) DR CALUX-TEQ/g fat in final four bioassays, (Fig1-a). Although the results from the salted duck egg samples, determined by the DR CALUX[®] bioassay, was higher than the result determined by the HRGC/MS analysis, they complied with the maximum allowable level for dioxins in egg sample in Taiwan. We believed that the DR CALUX[®] bioassay could be used as a stable method to screen for dioxins and dioxin-like compounds in salted duck egg samples. For the century egg sample, even modifying the sample weight or adding more than one acid-silica columns, resulted in 7.92 ± 2.44 pg DR CALUX-TEQ/g fat from four bioassays, which was significantly higher than the maximum allowable level for dioxins in eggs (Fig1-b). There had been some interference in the century egg sample, which caused the extraordinary results determined by the DR CALUX[®] bioassay. This indicated that using only acid-silica columns to clean up the interference in century egg sample was inadequate.

Bioassay results of duck egg and salted duck egg samples

The dioxin and dioxin-compound content in the fat of 8 duck egg samples (with yolk and albumin) and 16 salted duck egg samples (yolk only) was determined and the results are shown in Table 1. For the duck egg samples, the fat content ranged from 13.9% to 16.4% and the average level of dioxin and dioxin-compound was 1.81 ± 0.34 pg DR CALUX-TEQ/g fat. For the salted duck egg yolk samples, the fat content ranged from 43.4% to 50.6% and the average level of dioxin and dioxin-compound was 1.17 ± 0.55 pg DR CALUX-TEQ/g fats. The levels of dioxin and dioxin-like compound in all of the duck egg and salted duck egg yolk samples were lower than the maximum allowable level of dioxins in egg sample for Taiwan, and lower than the maximum allowable level of dioxins in egg sample for the EU, i.e. 6 pg WHO-PCDD/F-PCB-TEQ/g fat.⁵ In future studies, we plan to use DR CALUX[®] bioassay and the HRGC/MS assay to determine the levels of dioxin and dioxin-like compounds in seafood, livestock, and poultry products. The results from the two methods will be compared, in order to evaluate the application of DR CALUX[®] bioassay for analysis of these materials in Taiwan.

Acknowledgements

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Figure 1. One salted duck egg sample (a) and one century egg sample (b) of known content of dioxins (0.612 pg WHO₉₈-PCDD/DF-TEQ/ g fat and 0.728 pg WHO₉₈-PCDD/DF-TEQ/ g fat) was used as a reference material for modifying cleanup procedures with DR CALUX bioassay. After modifying three bioassays, we determined a stable DR CALUX bioassay procedure (from the fourth assay) for the analysis of salted duck egg samples. However, after modifying four bioassays, the results of century egg sample determined by DR CALUX bioassay were still higher than the maximum allowable level for dioxins in eggs in Taiwan.

Table 1. Fat content and the DR CALUX[®] analysis results of dioxins and dioxin-like compounds in duck egg and salted duck egg samples

	Number of	Fat content	Dioxin and dioxin-like compounds
Sample	sample	(%)	(pg DR CALUX-TEQ /g fat)
Duck egg (with yolk and albumin)	8	$15.1 \pm 0.9 (13.9 \sim 16.4)^{1}$	1.81 ± 0.34 (1.38~2.36)
Salted duck egg (yolk only)	16	46.5 ± 1.9 (43.4~50.6)	1.17 ± 0.55 (0.56~2.77)

¹Numbers represent mean \pm SD with the ranges shown in parentheses.