

DIOXIN '88 – The 8th International Symposium on Chlorinated Dioxins and Related Compounds in Umeå, Sweden

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Introduction

The 8th International Symposium on Chlorinated Dioxins and Related Compounds (Dioxin'88) took place in Umeå, Sweden, August 21 – 26, 1988. The Symposium hosted approximately 500 participants from 19 countries and 290 papers were discussed after oral or poster presentations (1). The session themes back in 1988 were similar to those of today. Sessions covered e.g. Analytical Methods, Sources, Environmental Levels, Toxicology, Human Levels and Epidemiology. Further, incineration formation mechanisms and flue gas cleaning techniques were discussed in a Special Seminar.

Professor Christoffer Rappe of Umeå University chaired the Symposium and formed together with Marianne Hansson and Mats Tysklind the executive committee for Dioxin'88 (See Figure 1). The program was drawn up with the support of a National Organizing Committee, a Nordic Committee for the Special Seminar on Incineration and, of course, the International Advisory Board.



Figure 1. The Executive committee for Dioxin'88, Mats Tysklind, Marianne Hansson and Christoffer Rappe (Chairman of the Symposium), in front of an VG 70S HRMS instrument.

In 1988 the International Advisory Board consisted of 13 internationally well established scientists in the dioxin field, several of whom are also members of the International Advisory Board for Dioxin 2005 in Toronto, e.g. Professors Otto Hutzinger, Frank Karasek, Yoshito Masuda and Stephen Safe.

Some Scientific Highlights

In 1988 all abstracts were one page and full articles were published in a Special Issue of *Chemosphere* (2). The goal to have the printed version ready for Dioxin '89 in Toronto, Canada, was achieved. The special issue consisted of more than 180 full papers.

In 1988 there was strong public concern and debate of dioxins in e.g. contaminated food and the importance of different sources of dioxins. In Sweden and abroad combustion of municipal solid waste caused legal actions and mechanisms for the formation of dioxins and related compounds was discussed at the conference. In her opening speech, Birgitta Dahl, the Swedish Minister of the Environment encouraged all dioxin researchers to keep up their important work. Of special interest were dioxins in bleached as well as un-bleached pulp and paper. During the conference many new results regarding PCDDs and PCDFs in consumer paper products were presented. Rappe and co-workers presented new results of dioxins in diapers, bleached as well as un-bleached shopping bags and cigarette paper. The highest levels were found in bleached coffee filters which caused a great deal of public concern and debate.

Other sources of concern were identified by new emissions data from the metallurgical industry. Organic chlorine but also inorganic chlorine in metal processes were shown to form dioxins at e.g. scrap metal melting facilities. The combustion of municipal solid waste was in focus during the end of the 1980's and this field received attention in a special seminar at Dioxin '88. Many new studies by e.g. Ballschmiter et al., Yamamoto et al., and Stieglitz et al. presented new insights into the mechanism of dioxin formation in thermal processes. In the area of Environmental Levels new data were presented on concentrations in soils, sediments, and ambient air. However, quite a few studies still presented data on 2,3,7,8-TCDD only. A number of studies focused on the environmental behavior of TCDD, such as translocation in the soil compartment, leaching and transport in land fills and different partitioning studies. A number of studies also presented data on concentrations in biological samples such as fish and Blue mussels.

In the Analytical sessions new improvements both in the clean-up of different matrices as well as developments in mass spectrometric techniques were presented. MS/MS applications for e.g. human samples were presented as a time efficient way of analyzing less purified samples. The use of ^{13}C -labelled internal standards "improved" the quality of analyses but in 1988 not all 2,3,7,8-substituted PCDDs and PCDFs were commercially available. K. Olie and co-workers illustrated the importance of using ^{13}C -standards due to the decomposition of OCDF and OCDD in the GC injector.

The Toxicology sessions included many new studies on retention, tissue distribution and metabolism of single congeners or mixtures of PCDD/Fs. Concentrations in various human samples, such as human blood and mother's milk were discussed in relation to toxicological response levels. Poiger et al. presented an update on the toxicokinetics of 2,3,7,8-TCDD based on

the ³H-labelled 2,3,7,8-TCDD which Poiger had ingested some years earlier. This study attracted a lot of media attention and was one of the most highlighted during the conference. Furthermore, new data on serum concentrations of exposed chemical workers as well as Vietnam veterans were presented and connected to various epidemiological studies.

During Dioxin '88 the use and relevance of toxic equivalents were discussed. Two different toxic equivalent factor concepts were presented, viz. the so-called Nordic TEFs and I-TEFs. Ulf Ahlborg presented the recent Nordic risk assessment of PCDDs and PCDFs. In this risk assessment a weekly intake (TWI) of 35 pg TCDD-equiv./kg body weight was considered tolerable and a new model for TEF was proposed. During the meeting US EPA organized a special symposium seminar on prospective research and regulatory issues concerning chlorinated dioxins and related compounds focusing on the need for research in the regulatory management of these compounds. During this seminar and the Risk Assessment session, Kutz et al also presented the international TCDD equivalents proposed by an international working group. The only difference between the two TEF concepts was the assigned value for 1,2,3,7,8-PCDF which in the international model was 0.05 instead of 0.01. Further, in the Risk Assessment session, S. Safe showed that although the interspecies potencies of PCDD/Fs vary widely, the structure-activity relationships observed for Ah receptor-mediated in vitro and in vivo responses are comparable. Based on this fact, Safe concluded that 2,3,7,8-TCDD equivalent values could be utilized for risk assessment of individual PCDD and PCDF congeners and simple in vitro or in vivo bioassays used for risk assessment of PCDD/F mixtures.

The conference ended with a panel discussion in connection with the Risk Assessment session focusing on future research needs in the dioxin field, especially new data needed for a better understanding of the toxicity of dioxins and related compounds.

Some Good Memories

The Symposium in Umeå 1988 also gave many good memories. The planning of the event started quite late as compared to today and as late as in April 1987, it was decided that Umeå should host the conference. This decision was taken after a visit by professor Otto Hutzinger for "inspection" of the facilities. The executive committee now had quite a busy time organizing the framework of the meeting and producing invitation flyers before Dioxin '87 in Las Vegas, US.

The weather was nice during the conference week in August, 1988, which of course was part of the plan, especially for the boat trip to Vasa, Finland. The Special Seminar on Incineration took place on the ferry but for most of the participants the boat cruise was a social event. On board the ferry "Wasa Express" everyone enjoyed lunch and Swedish "Smörgåsbord" as well as Tax-free shopping. If the Symposium had been lucky with sunny weather during the first few days, this was certainly not the case during the guided bus tours in Vasa. The heavy rain which reduced the visibility to zero caused much laughter and people still remember Vasa but have not really seen the town. Some people also remember the Finnish customs which had problems handling such a large group of scientists from many countries visiting Finland for just 2,5 hours (this story was also reported in Swedish newspapers).

Another good memory is the cray fish party which was held on the last evening of the conference. A cray fish party is a very special Swedish tradition and certainly not a typical conference banquet. Delicious, red cray fish boiled in dill water was served together with "Schnapps". Everyone also got a lesson in how to sing the traditional cray fish songs. The party kept on until the wee hours and according to some participants some of the things that happened that night are not fully known.

References

- (1) Final Program and Abstract Book - Dioxin'88, Umeå University, August, 1988.
- (2) C. Rappe, U.G. Ahlborg, J.-P. Aittola, C. Benestad, L. Dencker, A. Grove, M. Hansson, B. Jansson, N. Johansson, S. Montin and M. Tysklind (eds). "Chlorinated Dioxins and Related Compounds 1988", Chemosphere, Vol. 19, Nos 1-6, 1989.