

# DETERMINATION OF TRACE LEVEL DECHLORANE FLAME RETARDANTS IN FOOD AND FEED BY A NEW APPROACH BASED ON LOW RESOLUTION GC-MS/MS

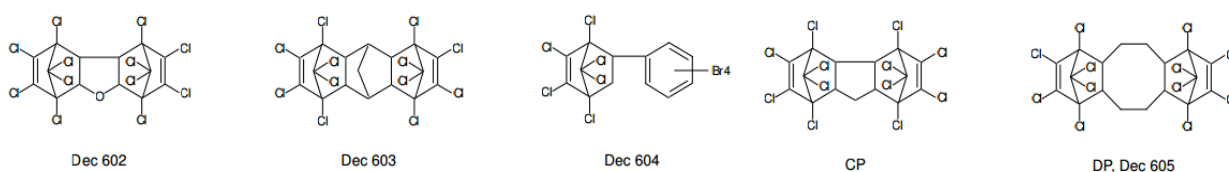
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Dechloranes represent a new class of organochlorine pesticides (OCPs) with flame retardant properties belonging to hexachlorocyclopentadiene (HCCPD) Diels-Alder adducts. They have been used to partially replace Mirex for nonagricultural uses after Mirex was banned in the 1970s due to its toxicity [1]. The main pesticides used at this aim are Dechlorane 602, Dechlorane 603, Dechlorane 604, Chlordene Plus (CP) and Dechlorane Plus whose relevant chemical structures are reported in Figure 1.



**Figure 1.** Chemical structures of Dec 602, Dec 603, Dec 604, CP and DP

Hoh et al. first reported on the environmental occurrence of Dechlorane Plus (DP) within the North American Great Lakes Basin [2] and more recently, "DP-like" substances have also been detected in the Great Lakes [3]. These compounds have been found in soil and fish samples in Canada, in air, soil, and sediment also in China [4]. It is, therefore, important to measure their current levels in the environment and to determine what effects an increase in production and use would have on environmental and human safety. In a previous work, we reported on the Dechloranes levels in human serum found in France [5] suggesting some plausible routes of human exposure such through food consumption. The aim of this study is to develop a method based on a low resolution GC-MS/MS to quantify Dechlorane 602, 603, 604, DP, CP, and Mirex in feed/food samples collected during continuous EU dioxins monitoring campaign.

First, MRM transitions were optimized and the method validated on Dechloranes standards also by recurring to experimental design. Then the method was applied to foodstuffs and the obtained results were correlated to food habits.

## References

- [1] International Program of Chemical Safety: Environmental health criteria 44, mirex. Report available at: <http://www.inchem.org/documents/ehc/ehc/ehc44.htm>. Accessed May 2013
- [2] Hoh E, et al. Environ Sci Technol.40 (2006) 1184
- [3] Shen L, et al. Environ. Sci. Technol. 44 (2010) 760
- [4] Wang DG et al. Environ. Sci. Technol. 44 (2010) 6608

[5] Brasseur, et al., Environ. Int. 65(2014) 33