

Title: **Analysis of brominated flame retardants in air and dust samples**

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Flame retardants (FRs) refer to a wide range of chemicals used since ancient times, which are added to combustible materials with the aim of increasing their fire resistance, preventing the spread and providing additional escape time. However, some properties such as persistence in the environment, bioaccumulation and biomagnification, as well as toxicity have been and remain a cause for concern since they can cause adverse effects on human health. The group of polybrominated diphenyl ethers (PBDEs), a type of brominated flame retardant (BFR), has been one of the most produced and used for a long time. Nevertheless, several studies demonstrated their bioaccumulation and toxicity, leading to their prohibition more than a decade ago. As a consequence, have arisen emerging flame retardants (EFRs), alternative compounds that have a similar structure to banned BFRs, but whose use is not restricted. This project will focus on the analysis of 13 BFRs including not only legacy PBDEs but also EFRs, in dust and air samples from homes, schools and offices. The analysis involves a first extraction phase using an automated pressurized liquid extraction system and a purification stage using acid attacks and solid phase extraction with alumina cartridges. Instrumental analysis will be carried out using gas chromatography (GC) coupled to tandem mass spectrometry (MS/MS) working in electronic impact mode.

This methodology has allowed the determination of the levels of PBDEs and EFRs in air and dust obtaining satisfactory results. The presence of BFRs has been detected in all the samples, thus demonstrating their presence in the environment.

Key words: Brominated flame retardants, bioaccumulation, biomagnification, toxicity, gas chromatography, tandem mass spectrometry, electronic impact