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503 - Screening and source identification of flame retardants in car indoor dust using field emission electron probe micro analyzer

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Abstract Body: Automobile is an important means of transportation in our society. People spend 5% of their time in cars, which proportion is next to home and office. Therefore, the vehicle cabin has recently been recognized as one of important indoor environments. At the same time, exposure to pollutants in car has become to be considered to have a significant impact on human health. Flame retardants are used in vehicles to achieve the desired flame-resistant properties to reduce the risk of fire. Although flame retardants are important for our safe life, some of them are suspected to possess adverse effects due to their toxic properties. For semi-volatile organic compounds such as flame retardants, dust in car might play an important role on human exposure to pollutants due to their property of low volatility. To reduce their risks, identification of pollutant sources is necessary to take appropriate countermeasures against them. In this study, using a field emission electron probe micro analyzer (FE-EPMA), methods for screening and source identification of flame retardants in car indoor dust was investigated. Effects of experimental parameters such as dust immobilization methods and magnification on FE-EPMA mapping results were also investigated. From the results of FE-EPMA mapping, following results were obtained: 1) the dust immobilization method using Adfix Wax was suitable for dust immobilization among carbon tape, Aron Alpha and Mounting Wax, 2) FE-EPMA mapping in low magnification was suitable for screening of flame retardants, 3) FE-EPMA mapping in high magnification could help to identify sources of flame retardants.