Material Flow Analysis (MFA) of Brominated Flame Retardants (BFRs) in Waste TVs Management and Recycling in Korea

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ABSTRACT

TV housing rear covers consist of small portion of brominated flame retardants (BFRs). Improper management and disposal of such waste can pose impacts to the environment and human health. To avoid contamination of BFRs into the environment and for safe disposal, the restriction of the use of certain hazardous substances (RoHS) directive, established a limit for BFRs (less than 0.1% concentration of PBDEs) on EEE in 2006. Although TV housing rear covers consists of limited BFRs, it is still a matter of concern for those TV that were manufactured before the Directive. In Korea, there are very few available statistical data regarding BFRs levels in TVs housing rear covers. In order to provide additional measures related to management of BFRs, there is a need for a quantitative material flow study on the amount of BFR found in TVs. This can be achieved by the aid of material flow analysis (MFA) of the TV sets and by studying the Deca-BDE components present in the TV housing rear covers. In this study, the relevant data were collected from the statistical reports and through field site visits to the WEEE recycling facilities. According to this study, in 2011, households in Korea used 73,821 tons of TV sets of which 23,592 tons of waste TV sets were collected and recycled by municipalities and producers. According to this study, in 2011, the producer accounted for 78% of the total TV collected and it was predicted that Deca-BDE in use stage would reach 5.59 ton by 2016. In addition, the amount of Deca-BDE present at the disposal and recycling stage is estimated to be approximately 30.2 tons by 2018.
Keywords: WEEE, RoHS, MFA, TV, recycling, BFR