

(70)

**Method Validation for Analysis of Aroclor 1260 in Transformer Oil using Gas Chromatography-Electron Capture Detection****Jeevanantham J.J.<sup>1</sup>, Dissanayake D.A.T.W.K.<sup>2\*</sup>, Liyanaarachchi G.V.V.<sup>2</sup>,  
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Welikada, Rajagiriya, Sri Lanka*<sup>2</sup>*Industrial Technology Institute, Colombo 7, Sri Lanka**\*thanuja@iti.lk***Abstract**

Polychlorinated Biphenyls (PCBs) are a group of synthetic aromatic compounds which has been used as thermal insulators and coolants in transformers, capacitors, motors and hydraulic systems due to the high thermal capacity and also as stabilizers in the paint industry. The number and the location of chlorine atoms in a PCB molecule determine many of its physical and chemical properties. Despite its applications, PCBs are considered as persistent organic pollutants (POPs) and they have been identified as carcinogenic to human and classified under the group 1 by the International Agency for Research on Cancer (IARC). This study presents the validation data of the method developed for analysis of Aroclor 1260 in transformer oils. The transformer oil samples were prepared according to the ASTM D 4059 with few modifications and analyzed by Gas Chromatography–Electron Capture Detection (GC-ECD) using HP 5 GC column (30 mx0.32 mm x0.25 µm) with a temperature programme starting from 100° C to 300° C at a rate of 15° C min<sup>-1</sup>. The PCBs in transformer oils were extracted to 2,2,4-Trimethylpentane followed by deactivated florisil cleanup. The study was performed under matrix matched condition to eliminate the matrix effect that was found to be significant. The method was found linear over a wide working range from 2.5-100 ppm and the linearity of the method was 0.994 with a lower limit of determination of 2.5 ppm. The method shows satisfactory repeatability with relative standard deviation below 7% over the entire working range. Accuracy of the method was assured using spike recoveries at 5 ppm, 10 ppm and 50 ppm with 85%, 105% and 93% respectively. The selectivity of Aroclor 1260 was confirmed against Aroclor 1254 and Aroclor 1242 considering uniquely identified non – overlapping chromatographic peaks with reference to the standard reference materials (SRMs). Based on the performance characteristics, this method can be suggested as an accurate and precise methodology to analyze Aroclor 1260 present in transformer oil.

**Keywords:** PCB, Gas chromatography-electron capture detection, Aroclor 1260, Transformer oil