Relative profiles of PCN and PCB homologues

The relative compositions of PCN and PCB homologues (expressed as percentage of the total) in total concentrations were calculated for the sediment core from Tokyo Bay (Figure 2). The profiles of PCN homologues in the sediment core varied depending on the depth. For the PCN homologues in the sediment core, lower chlorinated homologues (TrCNs to PeCNs) were dominant in the upper layers above 17.5-19 cm. These profiles of PCN homologues seem to resemble the data reported in the publication related to Tokyo Bay sediment core[3,15]. In deeper layers, the compositions of lower chlorinated homologues decreased with depth, only the compositions of PeCBs were dominants. The relative composition of PCB homologues in the sediment core was almost stable in each layer. TeCBs and PeCBs were the predominant homologues in most of the sediment core layers.

The relative contribution of PCN congeners in sediment core from Tokyo Bay in Japan are summarized in Figure 3. The pattern of PCN congeners was divided to two different profiles. Sediment section of 1-2 cm, represented the surface layers, the relative contribution of PCN congener was comparable in the most of congeners. The nos.21/24/14 and 33/34/37 were predominant congeners accounting for 18% and 10% of the total concentration respectively. Imagawa et al.[3] provide similar pattern of PCN congeners in sediment core from Tokyo Bay. The no.52/60 and 61 were the predominant congener in the layer 20.5-22cm represented the deeper layer, accounting for 26% of the total concentration. Except PeCN congeners, most of relative contribution of PCN congeners in the layer 20.5-22 cm was lower than surface layer. The nos.52/60 have been reported to be formed during incineration of municipal solid waste[16]. Incineration processes represented here by the sediment core pattern have to be considered as possible PCN sources in industrial areas.

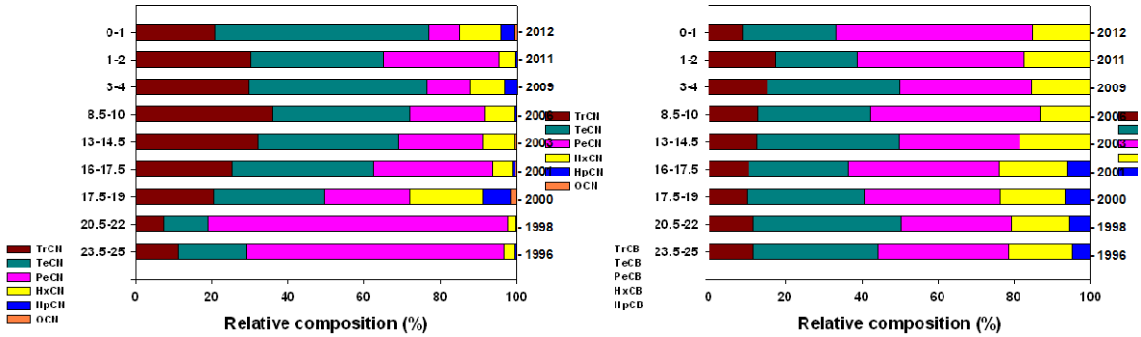

Figure 2. Relative composition (%) of PCN and PCB homologues in a sediment core from Tokyo Bay, Japan.

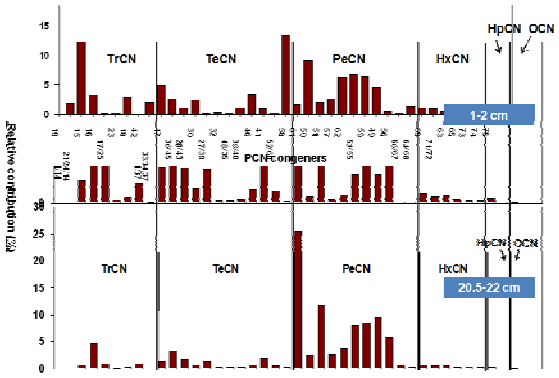

Figure 3. Relative composition (%) of PCN congeners in sediment core from Tokyo Bay, Japan.

Comparison profiles of PCNs/ PCBs and BPs

Figure 4 shows vertical profiles in concentrations of selected BP analogues, PCNs, and PCBs in the sediment core from Tokyo Bay, Japan. According to the published data[10], the total concentration of BPs ranged from 1.88 to 28.2 ng/g dw. The total concentration in BPs was higher than that in PCNs/PCBs. Moreover, the sediment layer that showed the highest concentration was obviously different between BPs and PCNs/PCBs. These results suggest the differences between current and historical releases of BPs and PCNs/PCBs. PCNs/PCBs, are conventional environmental pollutants used heavily in the past whereas BPs, are emerging contaminants.

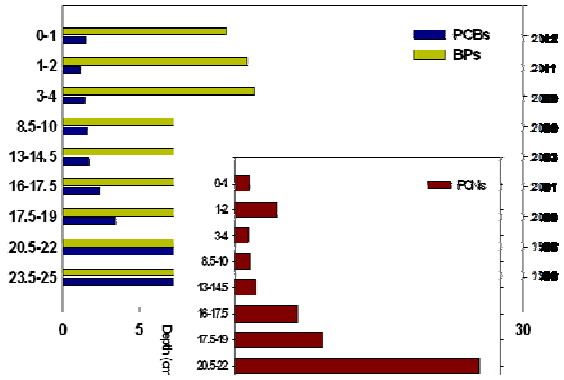

Figure 4. Vertical concentrations of PCNs, PCBs, and BPs in a sediment core from Tokyo Bay, Japan.

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