Greenpeace Research Laboratories Analytical Results 2018-03

Total organic carbon in samples of surface dusts from buildings in the vicinity of coal loading yards, Russia

June 2018

Introduction

5 samples of surface dust were received from Greenpeace Russia for analysis at the Greenpeace Research Laboratories on 29th May 2018. According to documentation supplied, all samples were collected in May 2018, from surfaces in buildings either in the vicinity of coal loading yards, or equivalent locations where coal loading yards are absent, in the Vladivostok area, South-East Russia. Details of the samples received are provided in Table 1.

Sample code	Site description	Location
RU18001	Near coal terminal	Nahodka (west part)
RU18003	Control location	Slavianka, about 50 Km from coal terminals
RU18005	Near coal terminal	Posiet
RU18006	Near coal terminal	Posiet
RU18007	Control location	Livadia, about 20 Km from coal terminals

Table 1: details of samples received and analysed at the Greenpeace Research Laboratories

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Materials and methods

All samples were collected in pre-cleaned glass bottles before shipment to our laboratory in the UK for analysis. Approximately 5 mg of each sample was accurately weighed into tin capsules, and then analysed for total organic carbon (TOC) content using a ThermoFisher Scientific Flash 2000 Organic Elemental Analyzer (OEA), together with appropriate quality control samples.

Further details of the methods employed can be provided on request.

Results and Discussion

Sample code	Site description	Total organic carbon, TOC (weight %)
RU18001	Near coal terminal	38.8
RU18003	Control location	12.0
RU18005	Near coal terminal	20.4
RU18006	Near coal terminal	12.3
RU18007	Control location	8.1

Table 1: concentrations of total organic carbon (TOC) in surface dust samples, in weight %

The 2 control samples (RU18003 and RU18007) had the lowest total organic carbon (TOC) content, 12.0 % and 8.1 %, respectively.

One of the samples collected near to a coal terminal in Posiet (RU18006) also has similar level to that of the control samples (12.3 %). For the other sample from Posiet (RU18005), the TOC content was somewhat higher (20.4 %), though was considerably closer to the values for the control samples than to a typical value for coal, which typically contains 80-95% total carbon, other than lignite which is generally lower (60-80 %) (JRC 2017).

The sample from Nahodka (RU18001) had a notably higher TOC content (38.8 %) total organic carbon, though this was still considerably lower than the TOC typically found in coal (JRC 2017).

The data do not indicate that any of the surface dust samples collected close to coal loading yards are entirely or predominantly composed of coal dust, though the data for one sample (RU18001), in the context of the results for the local surface dust control samples, is consistent with this sample collected near to a coal loading yard in Nahodka containing some coal dust as part of the mix of materials within the surface dust. It should be noted, however, that other studies have reported TOC content of indoor dusts from locations not close to point sources of coal dust of up to 30 % by weight (Garcia *et al*. 2007).

For more information please contact:

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References

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JRC (2017). Best Available Techniques (BAT) Reference Document for Large Combustion Plants, Joint Research Centre (JRC), the European Commission. http://eippcb.jrc.ec.europa.eu/reference/