



Method Summary

Coal Tar Arisings in Road Top Material

Scope and Range

This method details an approach to determine the presence of coal tar arisings in road top samples. The examination of the supplied materials enables the identification of petrogenic and pyrogenic materials.

References

Managing Reclaimed Asphalt - Highways and Pavements, ADEPT, version 2016-1

Dealing with coal tar bound arisings, CH2M, January 2018

Waste Classification - Guidance on the classification and assessment of waste, WM3, Environment Agency, 2018

Principle

Preparation and Extraction

A known mass of supplied material undergoes dichloromethane extraction under reflux.

Analysis of the resultant extract is performed as follows:

- Solvent extractable matter (SEM) is determined gravimetrically
- Fingerprint Analysis is undertaken using GC-FID
- Targeted Analysis (phenols and PAHs) and biomarker identification by GC-MS

Current guidance indicates that where the concentration of potentially carcinogenic hazardous substances is below 0.1% waste does not need to be classified as carcinogenic. Benzo(a)pyrene is used as a marker compound for carcinogenicity for certain coal tar entries. The assertion is that 50mg/Kg (0.005%) concentration of benzo(a)pyrene correlates to about 1000mg/Kg (0.1%) coal tar. Where the concentration of benzo(a)pyrene is below 0.005% the amount of coal tar present is considered low enough for the material to be considered non-hazardous.

The primary aim of these procedures is to determine the concentration of benzo(a)pyrene with additional lines of evidence to support the identification of coal tar in the sample. If present, the distribution of polycyclic aromatic hydrocarbons (PAHs) and alkylated-PAHs may indicate a petrogenic (bitumen) or pyrogenic (road tar) source.

Road tar is processed from coal tar so does not contain all the chemicals present in coal tar. In particular, most of the phenols and cresols are usually removed to make other products.

Bitumen, the alternative to road tar, is produced from crude oil. Bitumen is chemically complex and variable. During the production of bitumen, specific classes of compounds present in crude oil are retained. These compounds are referred to as biomarkers and their presence in road top indicates the presence of bitumen.

It was common to blend road tar and bitumen or use them interchangeably in the same construction course. Also, road tar and bitumen are miscible and over time it is possible for some tar products to

Method Number: TM 417

Updated: 16/03/2022

Issue Number: 01

Page 2 of 2



Method Summary

Coal Tar Arisings in Road Top Material

migrate into adjacent bituminous layers and vice versa.