



Jones Environmental Forensics

PAH sources Petrogenic, pyrogenic or phylogenetic?

High or unexpected PAH results are often a cause for concern, particularly in top soils.

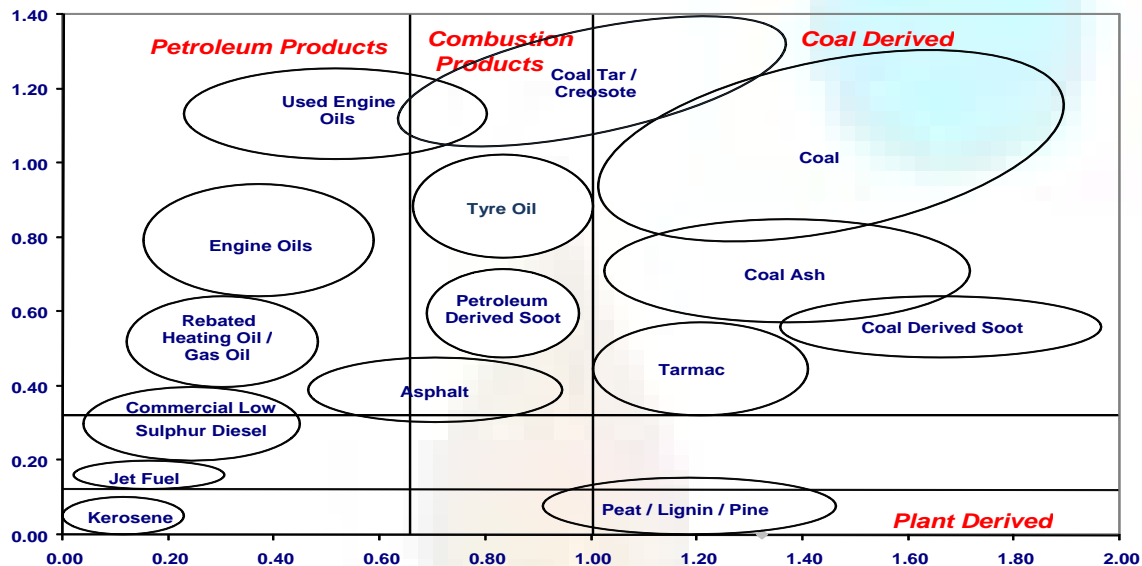
As civilisation relies heavily on combustion, PAHs are inevitably linked to our energy production, and their abundance directly proportional to combustion processes in the region. Different types of combustion yield different types of PAHs. Those produced from coal burning are different from those produced by motor-fuel combustion, which differ from those produced by forest fires. Some PAHs occur within crude oil, arising from chemical conversion of natural product molecules. They can be summarised into three distinct groups:

- **Phylogenetic** – hydrocarbon compounds derived from plants (phyto = plant)
- **Petrogenic** – hydrocarbon compounds associated with petroleum (petro= petroleum)
- **Pyrogenic** – hydrocarbon compounds associated with the combustion of petroleum, wood, coal etc including creosote, coal tar (pyro = fire/burn)

PAHs from petrogenic sources are not persistent and do not accumulate in sediments.

By plotting ratios of various PAHs including anthracene / anthracene+phenanthrene; fluoranthene / fluoranthene+pyrene; benzo(a)anthracene / chrysene and fluoranthene / pyrene it is possible to distinguish between combustion and petroleum sources, but caution is always required when reviewing these ratios in isolation, and further analysis including biomarkers is often required.

Illustration of a variety of double ratio plots using several different ratios.



For further information please contact us via our website: www.jones-forensics.com

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