Metallophorphyrins in coal. 4 TLC-NMR of iron porphyrins from coal: the direct characterization of coal hemes using paramagnetically Shifted^1 H NMR spectroscopy.

Autorzy

R. Bonnett

Franciszek Czechowski

Lechosław Latos-Grażyński

Rok wydania

1990

Czasopismo

Energy and Fuels

Numer woluminu

4

Strony

710-716

DOI

10.1021/ef00024a016

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

A new approach to the identification of iron porphyrins in coal is described that involves their separation from other porphyrins by preliminary thin-layer chromatography (TLC) followed by repeated TLC to separate the iron porphyrins. The repeated TLC involves both redevelopment with
a given solvent (multiple development) and with a sequence of solvent systems (sequential devel-opment). Homologous polyalkylporphyrins are separated in some cases; isomers generally are not.Hemes from Colorado coal are thus split into 22 fractions, with carbon numbers ranging from C32(most mobile on silica gel) to C^ (least mobile); these fractions are then examined by mass spectrometryand by paramagnetically shifted NMR spectroscopy of the corresponding low spin iron(III)
dicyanide complexes. The latter spectra are particularly useful in providing direct structural in-formation about the hemes extracted from coal. Etioheme III (C32) is confirmed as the most mobilecomponent, while mixed suites of monodemethylation products (C31, formed both by benzylic cleavageand by aromatic protiodesubstitution) and of monodeethylation (C30) products are isolated from and identified in coal porphyrins for the first time. The importance of these findings in relation to currenttheories of heme catagenesis is outlined.

Adres publiczny

https://doi.org/10.1021/ef00024a016

Strona internetowa wydawcy

https://www.acs.org/content/acs/en.html