

Palaeoenvironmental Reconstruction Of The Perth Basin

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The identification of novel long chain biomarkers in crude oils from the Perth Basin has lead to new concepts concerning the formation of the Perth Basin source rocks. The specific compound of interest to this study, crocetane, has been successfully synthesised for identification purposes and a method developed for its routine analysis. Crocetane and other related compounds have been determined to be specific to particular depositional environments rather than to the source of organic matter. Of the 50 Australian crude oils

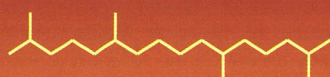
analysed, crocetane was observed in only seven, indicating very unusual conditions have lead to the formation of the Perth Basin source rocks. The presence of such compounds indicates that methane cycling was operational and hence highly anoxic conditions prevailed in the original depositional environment. This is the first reported evidence from crude oils of such unique conditions.

Biography

Cindy Barber graduated from Curtin University in July, 2001 with first class Honours. Her Honours research is being presented at the International Meeting of Organic Geo-chemistry to be held in France in September. She is currently enrolled as a PhD student with the Centre for Petroleum and Environmental Organic Geochemistry at Curtin. Cindy is continuing her research into palaeo-environment reconstruction and is beginning a collaborative project with the Norsk Hydro Research Centre in Norway on methane cycling.

CROCETANE

Crocetane (2,6,11,15-tetramethylhexadecane) is an irregular tail-to-tail linked C₂₀ isoprenoid



CROCETANE

AUSTRALIAN CRUDE OILS CONTAINING CROCETANE

SAMPLE	BASIN	AGE
Blina #1	Canning	Devonian
Boronia	Canning	Ordovician
Meda #1	Canning	Ordovician
Sundown #3	Canning	Ordovician
West Terrace	Canning	Ordovician
Dongara #8	Perth	Triassic
Mt Horner #9	Perth	Triassic

PALAEOENVIRONMENT RECONSTRUCTION OF THE PERTH BASIN

The presence of crocetane and PMI indicates highly anoxic depositional environment

The presence of isotopically depleted naphthalenes suggests a full methane cycle was operational

Biomarkers suggesting such unique conditions have never been reported from crude oils