

Tingkat maturasi serpih minyak pada CaCO_3 dan kaolinite dengan cara penentuan energi aktivasi menggunakan metode termogravimetri dan pirolisis = Maturation level oil shale on CaCO_3 and kaolinite with determination activation energy by using thermogravimetric and pyrolysis methods

Ordas Dewanto

Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20416065&lokasi=lokal>

Abstrak

[ABSTRAK

Material serpih adalah sejenis serpih minyak yaitu material clay atau karbonat yang mengandung banyak organik belum matang, apabila dipanaskan pada suhu tertentu, kandungan organiknya menjadi matang dan berubah secara fisika dan kimia, sehingga dapat menghasilkan bahan energi seperti migas. Dalam penelitian ini campuran material dimodifikasi dengan perbandingan: A=B, A#61500;B dan A#61502;B. Pengujian TOC menghasilkan clay-organik (SMC) dan karbonat-organik (SMK) menunjukkan kualitas yang sangat baik sebagai serpih minyak (TOC#8805;12.0%), yang diperkuat hasil analisis SEM (morfologi dan komposisi) dan XRD (interaksi dua material).

Hasil analisis Termogravimetri menunjukkan energi aktivasi material serpih clay (209-355 kJ/mol) lebih kecil dibanding karbonat (749-1339 kJ/mol), dan temperatur untuk proses reaksi material serpih clay (40-600OC) lebih kecil dibanding karbonat (75-740OC). Karakteristik tersebut menyebabkan tingkat maturasi material serpih clay lebih cepat dibanding karbonat, diperkuat Tmax serpih clay (315-323OC) lebih kecil dibanding Tmax serpih karbonat (415-493OC). CEC 2 (serpih minyak) memiliki karakteristik yang sama dengan serpih clay ($E_a=239$ kJ/mol dan $T=40-600OC$). OD1-Ast3 memiliki tingkat maturasi yang paling bagus ($E_a=234$ kJ/mol dan $T_{max}=315OC$) sesuai dengan serpih minyak (CEC 2). Hasil pengujian Rock Eval Pyrolysis menunjukkan material serpih clay dan karbonat mempunyai potensi tinggi (menghasilkan oil dan gas). Hasil pemanasan material serpih diperkuat oleh hasil pengujian FTIR yaitu senyawa dengan gugus fungsi tertentu terlepas dan muncul puncak baru di bilangan gelombang 2900 cm^{-1} yang menunjukkan keberadaan hidrokarbon ikatan tunggal dari rantai karbon panjang C-H.;

<hr>

ABSTRACT

The material is a kind of shale oil shale is clay or carbonate material containing organic many immature, when heated to a certain temperature, the organic content of becoming mature and change in physics and chemistry, so it can produce energy materials such as oil and gas. In this study a mixture of materials modified by comparison: A=B, A#61500;B and A>B. TOC testing of clay-organic (SMC) produce and organic carbonates (SMK) demonstrate excellent quality as shale oil (TOC#8805;12.0%),

which confirmed the results of scanning electron microscopy (SEM) analysis (morphology and composition) and X-ray diffraction (XRD) (interaction of two materials).

The results of thermogravimetric analysis showed activation energy shale clay material (209-355 kJ/mol) is smaller than the carbonate (749-1339 kJ/mol), and the temperature of the reaction process shale clay material (40-600OC) is smaller than the carbonate (75- 740OC). These characteristics cause the maturation level of clay shale material faster than carbonate, shale clay reinforced Tmax (315-323OC) is smaller than Tmax flakes carbonate (415-493OC). CEC 2 (shale oil) has the same characteristics as the flakes of clay (Ea=239 kJ/mol and T=40-600OC). OD1-Ast3 have the most good maturation rate (Ea=234 kJ/mol and Tmax=315OC) in accordance with the shale oil (CEC 2). Test results show the Rock Eval Pyrolysis clay shale and carbonate material has a high potential (produce oil and gas).

Results heating shale material reinforced by FTIR testing results are compounds with specific functional groups apart and a new peak appeared at wavenumber 2900 cm-1 which indicate the presence of hydrocarbons single bonds of the carbon chain length of CH.;The material is a kind of shale oil shale is clay or carbonate material containing organic many immature, when heated to a certain temperature, the organic content of becoming mature and change in physics and chemistry, so it can produce energy materials such as oil and gas. In this study a mixture of materials modified by comparison: A=B, A<B and A>B. TOC testing of clay-organic (SMC) produce and organic carbonates (SMK) demonstrate excellent quality as shale oil (TOC=12.0%), which confirmed the results of scanning electron microscopy (SEM) analysis (morphology and composition) and X-ray diffraction (XRD) (interaction of two materials).

The results of thermogravimetric analysis showed activation energy shale clay material (209-355 kJ/mol) is smaller than the carbonate (749-1339 kJ/mol), and the temperature of the reaction process shale clay material (40-600OC) is smaller than the carbonate (75- 740OC). These characteristics cause the maturation level of clay shale material faster than carbonate, shale clay reinforced Tmax (315-323OC) is smaller than Tmax flakes carbonate (415-493OC). CEC 2 (shale oil) has the same characteristics as the flakes of clay (Ea=239 kJ/mol and T=40-600OC). OD1-Ast3 have the most good maturation rate (Ea=234 kJ/mol and Tmax=315OC) in accordance with the shale oil (CEC 2). Test results show the Rock Eval Pyrolysis clay shale and carbonate material has a high potential (produce oil and gas).

Results heating shale material reinforced by FTIR testing results are compounds with specific functional groups apart and a new peak appeared at wavenumber 2900 cm-1 which indicate the presence of hydrocarbons single bonds of the carbon chain length of CH., The material is a kind of shale oil shale is clay or carbonate material containing organic many immature, when heated to a certain temperature, the organic content of becoming mature and change in physics and chemistry, so it can produce energy materials such as oil and gas. In this study a mixture of materials modified by

comparison: $A=B$, $A \neq B$ and $A > B$. TOC testing of clay-organic (SMC) produce and organic carbonates (SMK) demonstrate excellent quality as shale oil (TOC=12.0%), which confirmed the results of scanning electron microscopy (SEM) analysis (morphology and composition) and X-ray diffraction (XRD) (interaction of two materials).

The results of thermogravimetric analysis showed activation energy shale clay material (209-355 kJ/mol) is smaller than the carbonate (749-1339 kJ/mol), and the temperature of the reaction process shale clay material (40-600OC) is smaller than the carbonate (75- 740OC). These characteristics cause the maturation level of clay shale material faster than carbonate, shale clay reinforced Tmax (315-323OC) is smaller than Tmax flakes carbonate (415-493OC). CEC 2 (shale oil) has the same characteristics as the flakes of clay ($E_a=239$ kJ/mol and $T=40-600OC$). OD1-Ast3 have the most good maturation rate ($E_a=234$ kJ/mol and $T_{max}=315OC$) in accordance with the shale oil (CEC 2). Test results show the Rock Eval Pyrolysis clay shale and carbonate material has a high potential (produce oil and gas).

Results heating shale material reinforced by FTIR testing results are compounds with specific functional groups apart and a new peak appeared at wavenumber 2900 cm^{-1} which indicate the presence of hydrocarbons single bonds of the carbon chain length of CH.]