Analisis total organic carbon, maturity, dan brittleness index untuk identifikasi potensi shale oil dari data sumur dan seismik di formasi anggota banuwati shale cekungan asri = Analysis of total organic carbon maturity and brittleness index to identification of shale oil potential from well and seismic data in member banuwati shale formation asri basin

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Abstrak

Tujuan dari penelitian ini adalah untuk menentukan potensi shale oil di Formasi Anggota Banuwati Shale, Cekungan Asri, dengan melihat parameter Total Organic Carbon (TOC), Maturity, dan Brittleness Index. TOC dimodelkan dengan melakukan crossplot antara TOC measured dengan log gamma ray, log density, log neutron porosity, dan log P wave (multi linier regresi). Brittleness index dimodelkan dengan mengkombinasikan log Young’s modulus dan log Poisson’s ratio, serta dibandingkan dengan brittleness index yang dimodelkan dari beberapa data x ray diffraction. Maturity dijadikan sebagai salah satu parameter untuk menentukan kategori TOC, oil atau gas. Shale yang memiliki TOC > 1 wt.%, memiliki thickness > 50 ft, dan brittle merupakan zona potensi shale oil. Shale di Formasi Anggota Banuwati Shale didominasi oleh tipe kerogen I, lingkungan pengendapan lacustrine, dengan early mature di kedalaman 8132 ft (Delima-1). Berdasarkan inversi simultan, diketahui bahwa persebaran shale yang berpotensi menjadi shale oil berada di arah Timur Laut dari sumur Delima-1, pada depth > 9500 ft, dengan ketebalan 200 – 300 ft.
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The purpose of this research is to determine the potency of shale oil in Member Banuwati Shale Formations, Asri Basin, with use Total Organic Carbon (TOC), Maturity, and Brittleness Index parameter. TOC is modeled by multiple linear regresion method. This method is crossplot between TOC measured with gamma ray log, density log, neutron porosity log, and P wave log. Brittleness index is modeled by combining Young's modulus log and Poisson's ratio log, where this model called brittlenes index geomechanic model. After that this model compared with brittleness index model from mineralogy. Maturity is one of the parameters used to determine category of TOC, oil or gas. Shale which has TOC more than 1 wt.%, has a thickness more than 50 ft, and has brittle is potential to be shale oil. Shale in Member Banuwati Shale Formation is dominated by kerogen type I, lacustrine depositional environment, with early mature in depth 8132 ft (Delima-1). Based on simultaneous inversion, known that distribution of shale which is potentially into lying in the northeast of Delima-1 well, in depth > 9500 ft, with thickness 200 – 300 ft.