

Title (en)  
SUPERCRITICAL HYDROEXTRACTION OF KEROGEN FROM OIL SHALE ORES

Title (de)  
ÜBERKRITISCHE HYDROEXTRAKTION VON KEROGEN AUS ÖLSCHIEFERERZEN

Title (fr)  
HYDROEXTRACTION SUPERCRITIQUE DE KEROGENE A PARTIR DE MINERAIS DE SCHISTES BITUMINEUX

Publication  
**EP 2066762 A2 20090610 (EN)**

Application  
**EP 07842097 A 20070907**

Priority  
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• US 52386006 A 20060920

Abstract (en)  
[origin: US2007012598A1] Water is added to reduce the hydrogen consumption in kerogen conversion. The water is not stripped from oil shale ores, instead up to 10% w/w of water is added in the kerogen conversion at 400-475° C. The recycle solvent for conversion is changed to a high boiling point fraction of the oil, with a minimum boiling point of the order of 245° C. Such repeated recycling of high boiling fraction oil with a hydrogen-donor mid-distillate will remove additional sulphur, oxygen and nitrogen. It improves the quality of the final product oil. Most of the high boiling fraction of the oil will separate from the oil shale ores, at around 450° C. and 650 psig. Then it is reduced to 250° C. at 100 psig before distillation. Such column operates at around 10 to 250 psig, but preferably 50 psig. This improves thermal efficiency by avoiding the need to condense high boiling point vapors. The addition of water provides further enhancement in operating results. A consequence of recycling high boiling oil fractions is the repeated hydrogenation and hydrocracking of that fraction to increase the proportions of lower boiling fractions. This reduces the asphaltene content of the recycled and final product streams. Such is similar to hydro-visbreaking of bitumen, in which both the asphaltene fraction and the sulphur content can be halved, resulting in a product of 25-30° API gravity in a single pass. The recycling of high boiling fraction means approximately half of the product oil is repeatedly recycled. There is no recycle of the low boiling fractions. It is expected that the intractable asphaltene content of about 5% of the product oil will be in suspension under hydro-treating and hydro-cracking conditions. These are removed with the solids after a supercritical solvent wash.

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