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# SIMULATION STUDY OF IN-SITU CONVERSION PROCESS IN LOW-MID MATURITY SHALE OIL RESERVOIR

*Tuesday, 1 June 2021 11:00 (15 minutes)*

Continental shale oil in China is mainly of low-medium maturity. The formation is filled with heavy oil of low mobility and organic matter that unconverted. Horizontal drilling and hydraulic fracturing are insufficient to obtain economic production in such reservoir, thus in-situ heating and transform technology should be applied. To describe the decomposition of solid organic matter, cracking of heavy hydrocarbon, phase behavior and composition evolution, we developed a multiphase multicomponent hydro-thermal coupled numerical model and numerical solution method by considering multistage kinetic reactions. Then the impact of parameters including heating temperature, kerogen concentration, well bottom hole pressure, heating space and initial water saturation on cumulative production is analyzed. The results are summarized as: kinetic reaction rate is controlled by temperature and different reactions take place at variety heating temperature; higher kerogen concentration can enhance cumulative hydrocarbon production after in-situ conversion; low bottom hole can extract oil and gas quickly to prevent from coking; larger heating spacing would weaken the effect of in-situ conversion process, while the product will further crack with too small heating spacing; high water saturation will enhance energy consumption to heat water and reduce the utility ratio of energy, thus dewater process is required to reduce water saturation. This study analyzed shale oil in-situ conversion process based on thermal-reactive flow. The model developed can be used to evaluate the heating process and provide theoretical support for the efficient development of shale oil reservoir.

## Time Block Preference

Time Block A (09:00-12:00 CET)

## References

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