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## Synthesis and performance evaluation of high-temperature and high-salinity tolerance polymer microspheres

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Various technical problems are currently encountered in using regular plugging agents. The performance of these agents in terms of high temperature and salinity tolerance is poor. The cross-linking reaction time is difficult to control and the valid period of the operation measures is short. This study system of deep profile control and water shutoff was researched for high-temperature and high-salinity reservoirs. The microstructure of divinylbenzene-co-acrylamide microspheres were designed according to the principle of deep profile control and water shutoff. Scanning electron microscopy tests, showed that the interior of the microspheres was hollow and that the shell had a nanoporous structure. The basic performance of the microspheres was evaluated, including their suspension, temperature resistance, thermal stability, expansion, and plugging effect at 115°C. Results showed that the sedimentation rate of microsphere solution was 0.005 mL/min. The temperature tolerance of the microspheres was reached 300°C by thermal gravimetric analysis. After 180 days, the microspheres did not appear to be carbonized. The microspheres showed weak expansion and could migrate into deep reservoirs. The residual resistance coefficient of the injection and anti-injection experiments was still greater than 2. Only microsphere plugging slug was used. The amplitude of enhanced oil recovery reached 7%. Domestic oil field tests showed that, by increasing the amount of oil by 5.11t each day after profile control, the general water percentage decreased from 64.11% to 32.08%.

## **Biography**

Changchun Yang has completed his Master's degree from Xi'an Shiyou University and is a Doctoral candidate in China University of Petroleum-Beijing. He participated as mentor of National Key Scientific and Technological Project (Grant No.2011ZX05009-004) and National Basic Research Program of China (973 Program) (Grant No.2011CB707305). He has published more than 10 papers in reputed journals. His main research direction was about enhanced oil recovery and oil chemistry.

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