

FISCHER-TROPSCH SYNTHESIS COBALT NANO-CATALYST BASED ON POROUS MATERIAL CONFINEMENT, AND PREPARATION METHOD THEREFOR

ABSTRACT

The present invention provides a Fischer-Tropsch synthesis cobalt nano-catalyst based on porous material confinement, and a preparation method therefor. The catalyst of the present invention uses organogel as a template and is prepared by means of a sol-gel method; metal components are used as the core and the porous material is used as the shell. The metal components comprise a first metal component Co; a second metal component, being one of Ce, La, and Zr, and a third metal component, being one of Pt, Ru, Rh, and Re. In a finished catalyst, the first metal component accounts for 10%-35% by weight, the second metal component accounts for 0.5% to 10% by weight, the third metal component accounts for 0.02% to 2% by weight, and the rest is a carrier. The carrier is the porous material and is spherical, and the component thereof is nano-silica or alumina. The pore diameter of the porous material is 1-20 nm, the surface area is 300-500 m²/g, and the particle size of the active component is 0.5-20 nm. The core-shell structure cobalt porous catalyst of the present invention has the advantages of low methane selectivity, high catalysis reactivity, and good C₅⁺ selectivity, and the main products of the present invention are diesel oil and paraffin.

Fig. 1