

# Characterization and Properties of Polyethylene synthesized by Supported Non-Metallocene Catalyst.

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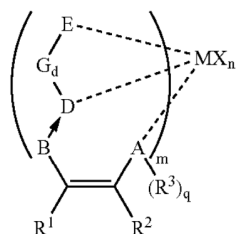
Polyethylene was synthesized from ethylene over supported non-metallocene catalyst (SSTS) by slurry process. The influence of polymerization conditions, such as total pressure, hydrogen partial pressure, temperature, amount of activator such as MAO, TEAL and comonomer such as 1-hexene, 1-butene, on catalytic activities and bulk density, particle size distributions, molar mass distribution, comonomer incorporation and distribution, mechanical performances, crystallization, morphology, thermal and rheology properties were investigated.

The results show that SST catalysts have excellent polymerization performance with lower activator amounts and obvious "comonomer effect". The polyethylene obtained therefore have higher bulk densities and adjustable distribution of molecular weight and comonomer with morphology, uniform particle size distributions, lower fine contents (less than 0.5 wt%), excellent crystallization and mechanical properties.

The kinetic absorption curve in ethylene polymerization is smooth with slow activity attenuation, and that in copolymerization is followed as delay type even with more copolymer amounts.

Therefore, peroxide cross-linked polyethylene (sPEXa) pipe was obtained by sPE with peroxide through extrusion mold. Synthesized sPE with weight average relative molecular mass near  $30 \times 10^4$  g/mol and MWD 4.05, hadn't fine powder in which particle diameter was smaller than  $75 \mu\text{m}$ , and had shear thinning rheological behavior which endowed sPE excellent process property; under  $95^\circ\text{C}$ , 4.8 MPa hydrostatic pressure conditions, the lasting time of sPEXa pipe without leakage and crack was 1875 h, much longer than industry standard of 1000 h.

Key words: supported non-metallocene catalysts, slurry polymerization; molecular weight distribution, performance; crystallization, morphology, comonomer incorporation and distribution, thermal analysis, rheology.



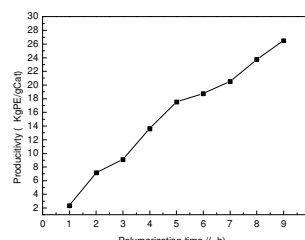
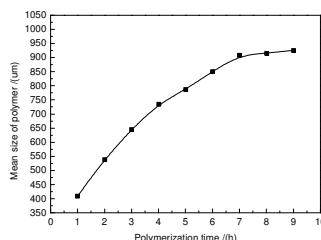
## Tridentate nonmetallocene Complex

Wherein: m and n: 3; q: 0 or 1;

d: 0 or 1; M: Ti or Zr;

X: Cl; R: hydrocarbonyl;

A, B, D, E, Gd: group containing N, S, P, or hydrocarbonyl



## The effect of Polymerization on SST productivity and polymer mean sizes.

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