

# Ethylene Polymerisation in Slurry Process Using Unsupported Metallocene Catalysis Systems

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## Abstract

Polyolefin industries have developed numerous proprietary technologies for their own production processes. These processes can be, in general terms, divided into three groups: gas, suspension (slurry) and solution processes. Among those, slurry polymerization is the easiest technology for polyolefin synthesis employing the heterogeneous catalyst in hydrocarbon polymerization media and leading to the slurry of polymer particles, which are usually separated by centrifugation. Although, heterogeneous catalyst has advantage against homogeneous catalyst, the development of the heterogeneous catalysts is critical since the surface area of the supported catalyst determines the availability of catalytic active sites and the reaction mechanism of such the solid catalyst is often unknown.

With the purpose to develop more efficient methodology for industrial conditions, we have successfully investigated and applied the homogeneous catalyst, solution of mixed metallocene and methylaluminoxane, for polyethylene synthesis in slurry polymerization process.

In this presentation, we will illustrate the utilization of unsupported metallocene catalysts together with catalytic activity improvement to polymerise ethylene in slurry polymerization process to obtain polyethylene with various polymer properties as well as controllable polymer morphology.

**Keywords:** homogeneous, unsupported, metallocene, ethylene polymerization, polyethylene

