# HIGH PERFORMANCE ZIEGLER-NATTA CATALYST SYSTEMS, PROCESS FOR PRODUCING SUCH $MgCl_2$ BASED CATALYSTS AND USE THEREOF

## ABSTRACT

Improved Ziegler-Natta catalysts and methods of making the improved catalyst are described. The Ziegler-Natta catalyst is formed using a spherical $MgCl_2$-xROH support, where R is a linear, cyclic or branched hydrocarbon unit with 1-10 carbon atoms and where ROH is an alcohol or a mixture of at least two different alcohols and where x has a range of about 1.5 to 6.0, preferably about 2.5 to 4, more preferably about 2.9 to 3.4, and even more preferably 2.95 to 3.35. The Ziegler-Natta catalyst includes a Group 4-8 transition metal and an internal donor comprising a diether compound. The catalyst has improved activity in olefin polymerization reactions as well as good stereoregularity and hydrogen sensitivity, and may be useful in the production of phthalate-free propylene polymers having a molecular weight distribution (PI(GPC)) in the range from about 5.75 to about 9.

Figure 1