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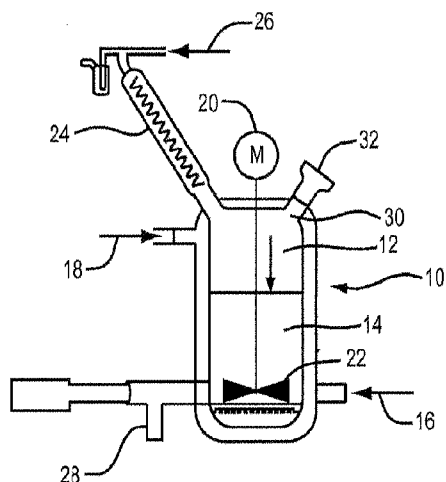
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(54) Title: HIGH PERFORMANCE ZIEGLER-NATTA CATALYST SYSTEMS, PROCESS FOR PRODUCING SUCH $MgCl_2$
BASED CATALYSTS AND USE THEREOF

Figure 1



(57) Abstract: Improved Ziegler-Natta catalysts and meth-
ods of making the improved catalyst are described. The Zie-
gler-Natta catalyst is formed using a spherical $MgCl_2 \cdot xROH$
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 dieth-
er compound. The catalyst has improved activity in olefin
polymerization reactions as well as good stereoregularity
and hydrogen sensitivity, and may be useful in the produc-
tion of phthalate-free propylene polymers having a molecu-
lar weight distribution (PI(GPC)) in the range from about
5.75 to about 9.