Project logo
**Relevant images**

Ca alkoxide

\[
R\text{O}_2\text{Ca} \rightarrow \text{O} \quad + \quad \text{H}_2\text{O} \quad + \quad \text{CO}_2 \quad \rightarrow \quad \text{CaCO}_3 \quad + \quad 2 \text{R-OH}
\]

\[
R = \text{CH}_3, \text{C}_2\text{H}_6, \text{C}_3\text{H}_7, 2\text{-PrOH}, ...
\]

Figure 1: Reactivity of Calcium alkoxides with atmosphere leading to the formation of Calcium carbonate

![Oligomerization of Calcium alkoxides](image)

Figure 2: Oligomerization of Calcium alkoxides, a process responsible of low solubility/insolubility of these compounds

![Additional Coordination of Ca Atom](image)

**Additional Coordination of Ca Atom**

The presence of a coordinating heteroatom in the ligands could saturate the metal

![Effect of the Length of the Chain](image)

**Effect of the Length of the Chain**

The presence of a bulky-R group could avoid polymerization

Figure 3: Possible modifications of the structure of Calcium alkoxides to modify their physico-chemical properties
Figure 4: Secondary electron images collected by FEG-ESEM from the coating of Ca(OTHF)2 after wetting.

\[
\text{solvent}
\text{low } T^\circ (-40^\circ \text{C})
\]

\[
\begin{align*}
\text{Ca}^{(0)} + \text{NH}_3 + \text{R-OH} & \rightarrow \text{R-} \text{Ca-O} \text{R} + \text{H}_2 \\
\text{R} & = \text{CH}_3, \text{C}_2\text{H}_6, \text{C}_3\text{H}_7, \text{2-PrOH}, ...
\end{align*}
\]

Figure 5: Ammonia reaction
Figure 6: Ca(OTHF)₂ synthesis – scale up to kilo/lab = 200g scale
Al alkoxide

Figure 7: Oligomers contained in the powder resulting after complexation of A18 with TEA and evaporation of the alcohol.

Figure 8: Complexation of aluminium alkoxide (a) and the intermediate A18 powder before preparation of the sol (b).
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