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Isocyanides can be polymerized to poly(iminomethylene) with NiCl₂ as a catalyst.

\[
\begin{align*}
n &\xrightarrow{\text{Ni}^{II}} \\
R-N=CH &\rightarrow [R-N=CH]_n
\end{align*}
\]

The polymers have a rigid, helical structure with 4 repeating units per turn and a helical periodicity of 0.4 nm. The side chains of the polymers are arranged in 4 stacks parallel to the axis of the helix.

We have prepared a poly(iminomethylene) which contains coronand side chains by polymerizing 4-(1-isocyanoethyl)benzo-18-crown-6 with nickel chloride. The coronands in the polymer form 4 molecular channels (Fig. 1), which strongly bind alkali and ammonium cations. The polymer provides a model for the study of ion transport through molecular channels in biological membranes.

![Fig. 1. Projection along polymer helix axis. The 5th repeating unit is behind the first, the 6th behind the second, etc.](image-url)