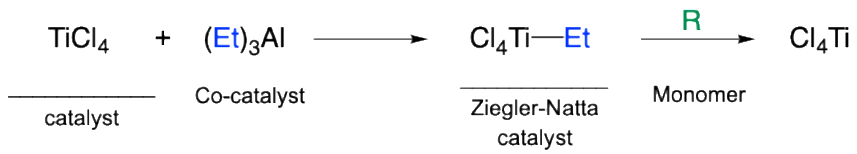
CONCEPT: ZIEGLER-NATTA POLYMERIZATION

- **Ziegler-Natta Polymerization** is highly stereo_____ for isotactic and syndiotactic polymers.
  - □ Uses **Ziegler-Natta catalyst:** organometallic complex most commonly containing ____ and ____.
    - Polymer stereochemistry is _____ specific.
- No radicals are formed which results in _____ polymers.

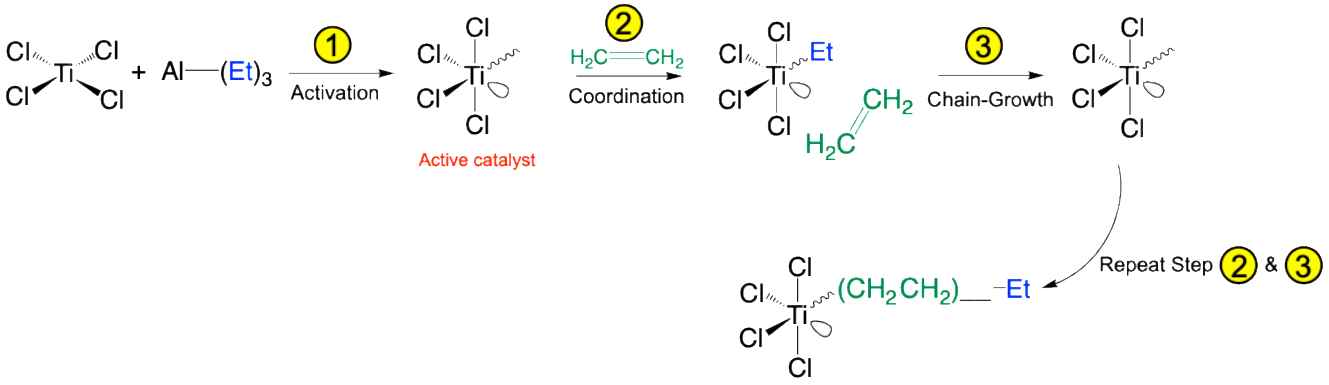
Ziegler-Natta Polymerization Overview



Mechanism

1. **Activation:** Ziegler-Natta catalyst is _____.
2. **Coordination:** Electrons from ____ bond of C__H2__ alkene **monomer** share with ____.
3. **Chain-Growth:** Electrons from Ti – Et group shift and **monomer** is inserted between ____ and ____ group.
   - □ Steps ___ and ___ are repeated as needed.

Ziegler-Natta Polymerization Mechanism



- Ziegler-Natta catalysts cannot be used with monomers containing _____ groups as it deactivates the catalyst.

EXAMPLE: Polypropylene is polymerized using a Ziegler-Natta catalyst which selects for isotactic stereochemistry.

Draw a segment of the resulting polymer.