The Chichibabin Reaction

**Chichibabin Reaction**: A substitution in which an amide anion (-NH2) attacks carbon 2 or carbon 4 of a pyridine ring, and a Hydride ion (H-), is the leaving group. Occurs via the nucleophilic aromatic substitution reaction mechanism.

**Chichibabin Reaction Mechanism:**

**Step 1 (Rate Determining Step)**: The incoming nucleophile (-NH2) attacks the delta + Carbon adjacent to the Nitrogen.
*This nucleophilic attack results in the loss of aromaticity.*
*The Carbon’s delta + is due to the fact Nitrogen is significantly more electronegative than carbon.*

**Step 2 (Aromaticity Restored when Hydride ion is Ejected)**: The leaving group (H-) is ejected.
*The restoration of aromaticity assists the Hydride ion’s ejection.*
*The Hydride ion is a “special circumstances only” leaving group—the special circumstance being the Chichibabin Reaction.*

**Miscellaneous Chichibabin Reaction Facts:**
- A type of polar pi bond reaction (C=N).
- Pyridine is the electrophile; amide anion is the nucleophile; hydride ion is the leaving group.
- This reaction can happen because even though the pyridine has aromaticity, the N destabilizes it.
- Aleksey Yevgenyevich Chichibabin discovered this reaction in 1914.
References:

<http://www.chem.ucla.edu/~harding/>