The Chichibabin Reaction

The Chichibabin reaction was discovered by Aleksý Yevgényevich Chichibain

**What is the reaction?**
The general process of the reaction involves taking **pyridine** (an aromatic molecule) and mixing it with **NH₂⁻**. The introduction of the NH₂⁻ replaces a hydrogen on the pyridine next to the N.

Because this reaction involves substitution on an aromatic ring, you would think this reaction would be EAS. **However, NH₂⁻ is a nucleophile** which makes the pyridine the electrophile so this reaction is not actually EAS.

**What is the mechanism?**

1. NH₂⁻ can attack the carbon next to the nitrogen because the carbon is polarized. The adjacent nitrogen is more electronegative than the carbon and that gives the carbon a δ⁺ charge.

2. A negative consequence of this first step is that aromaticity is lost. The resulting structure still has some stability as the negative charge on the nitrogen is stabilized by the resonance in the ring (Image 2).

3. A unique thing about the Chichibabin reaction is that this reaction is one of the only known cases where **hydride is a true leaving group** and doesn’t just directly transfer to another molecule when leaving.

4. The reason hydride can leave in this reaction is because when the hydride leaves, aromaticity is restored in the ring.

This type of reaction is called **Nucleophilic Aromatic Substitution**
Works Cited


Images: