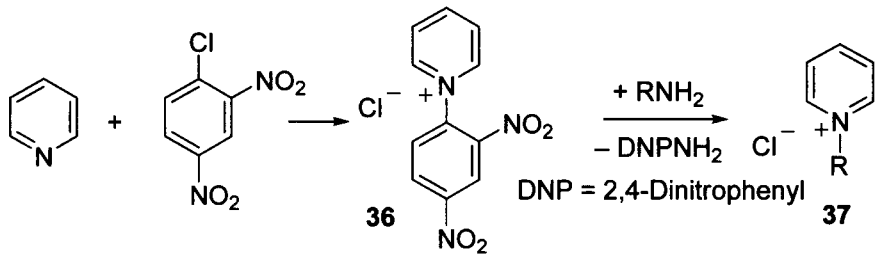
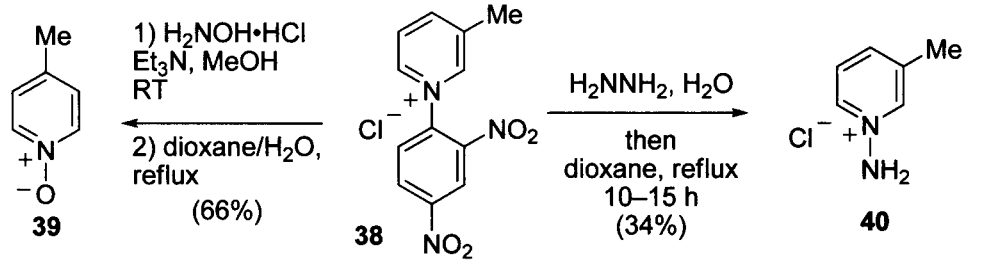
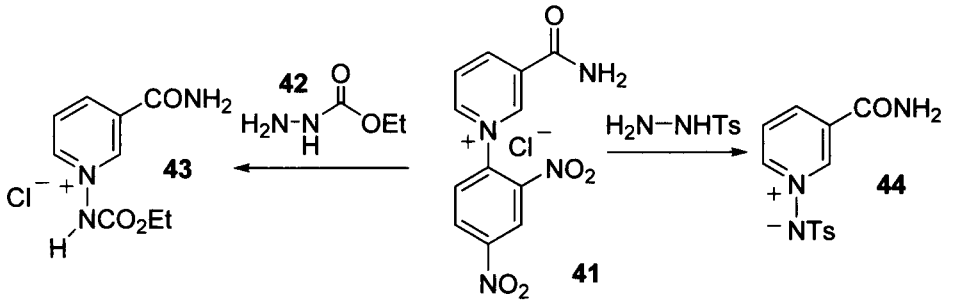


In addition to reactions with amines, Zincke salts also react with other nitrogen nucleophiles, such as hydroxylamine[29,30] and hydrazine,[29–31] providing various *N*-substituted pyridine derivatives, such as pyridine *N*-oxides **39** and *N*-aminopyridinium salts **40**.



Reactions with *N*-acyl or *N*-sulfonyl hydrazines gave rise to iminopyridinium ylides and ylide precursors such as **43** and **44**.[30–33] Benzoyl hydrazines are also used in the Zincke reaction under similar conditions.[34,35]



Zincke salts played an important role in the synthesis of NAD^+/NADH co-enzyme analogues. The nicotinamide-derived Zincke salt **41** has been widely used.[36–39] For instance, Zincke salt **41** was used to link with various adenine derivatives via the tether having a phosphonate functionality (**45**→**46**)[39c] to study through-space interaction between the pyridinium and base portions.