

The scheme illustrates the synthesis of 1-vinyl-4-vinylpyridinium salts (1) and their derivatives (2-34). The starting material 1 is a 1-vinyl-4-vinylpyridinium salt with a 2,4-dinitrophenyl group. It reacts with various reagents to form different products.

**Reaction I:** 1 reacts with  $R^1$ -Z-Ph-NH<sub>2</sub> in EtOH (80%) to form 2-5.

**Reaction II:** 1 reacts with  $Br$ -CH<sub>2</sub>-CH<sub>2</sub>-PO<sub>3</sub>(Et)<sub>2</sub> to form 27.

**Reaction III:** 27 reacts with  $H_2N$ -Ph- $R^3$  in EtOH (80%) to form 28-34.

**Reaction IV:** 27 reacts with 50% HCl in EtOH to form 28-34.

**Reaction V:** 1 reacts with  $OTs$ -Ph- $NO_2$  in MeCN to form 13.

**Reaction VI:** 13 reacts with  $H_2N$ -Ph- $R^2$  in EtOH (80%) to form 21-22.

**Reaction VII:** 13 reacts with  $H_2N$ -Ph-CH<sub>2</sub>-OH in EtOH (80%) to form 23-26.

**Reaction VIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction IX:** 13 reacts with (pyridin-4-yl)CH<sub>2</sub> and 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction X:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XXXIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XL:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction XLIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction L:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXIV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXV:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXVI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXVII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXVIII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXIX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXX:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXXI:** 13 reacts with 2 PhCH<sub>2</sub>Br to form 9-12.

**Reaction LXXXXXII:** 13 reacts with 2 PhCH<sub>2</sub>Br to form