An Unexpected [1,5]-H Shift in the Synthesis of Nitro-Anilines. [Organic Letters 2002, 4, 439]. Ian W. Davies,* Jean-François Marcoux, Jeremy D. Taylor, Peter G. Dormer, Robert J. Deeth, Félix-Antoine Marcotte, David L. Hughes, and Paul J. Reider.

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Scheme 1

Table 1: Reaction of MAA and 2-nitrovinamidinium hexafluorophosphate **1a^a**

entry	solvent	base	% yield 2a	% yield 3	ratio 2a:3
1	THF	KO ^t Bu	78	9	9:1
2	DMF	KO ^t Bu	65	14	5:1
3	CH ₃ CN	KO ^t Bu	70	14	5:1
4	MeOH	KO ^t Bu	70	9	8:1
5	MeOH	NaOMe	76	5	14:1
6	THF	KOH	70	8	9:1
7	THF	LiO ^t Bu	70	5	14:1

^a Reactions were conducted at room temperature with 1.05 equiv. of base and 1.1 equiv. **1a** for 4 hr. Assay yield was determined by HPLC analysis using analytically pure standards.

Table 2: Reaction of MAA and 2-nitrovinamidinium hexafluorophosphates 1 b – d ^a

entry		X =	% yield 2	% yield 3	ratio 2:3
1	1 b	pyrrolidine	91	7	13:1
2	1 c	piperidine	89	11	8:1
3	1 d	N,N-diisopropyl	ND	63	1:20

^a Reactions were conducted at room temperature with 1.05 equiv. of base and 1.1 equiv. **1 b - d** for 12 hr. Assay yield was determined by HPLC analysis using analytically pure standards.

Characterisation:

2a 2-(dimethylamino)-5-nitro-benzoic acid, methyl ester.

Literature: Krasnaya, Zh. A.; Stytsenko, T. S.; Bogdanov, V. S.; Daeva, E. D. **Unusual chemical transformations of α -nitro- β -(dimethylamino)acrolein.** Izv. Akad. Nauk SSSR, Ser. Khim. (1985), (7), 1604-12.

Typical procedure for the preparation of aniline **2**: To a stirred solution of methylacetoacetate (580 mg, 5 mmol) in THF (10 mL) at room temperature was added potassium tert-butoxide (5.25 mL, 1.0M in THF) over 5 minutes. The solution was aged for 5 minutes and nitro-vinamidinium hexafluorophosphate **1a** (1.74 g, 5.5 mmol) was added in one portion. The mixture was stirred at room temperature for 8 hr. The reaction mixture was diluted with ethyl acetate and washed with water. Concentration of the organic extracts and chromatography on silica gel eluting with ethylacetate/heptane gave the aniline **2** (842 mg, 75 %) as a light yellow solid. DSC peak 88.4 °C (lit. 81 - 83 °C.). Found: C, 53.66; H, 5.39; N, 12.30. C₁₀H₁₂N₂O₄ requires C, 53.57; H, 5.39; N, 12.49. ¹H NMR (400 MHz, CDCl₃) δ 8.55 (1H, d, *J* = 3 Hz), 8.15 (1H, dd, *J* = 9, 3 Hz), 6.85 (1H, d, *J* = 9 Hz), 3.93 (3H, s), 3.03 (6H, s). ¹³C NMR (100 MHz, CDCl₃) δ 167.1, 155.0, 137.1, 128.9, 127.4, 116.6, 114.6, 52.5, 42.9. HRMS, [M+H]⁺ 225.0864. Authentic material was prepared via S_NAr reaction of dimethylamine and 2-bromo-5-nitro-benzoic acid, methyl ester (See: Greizerstein, W.; Bonelli, R. A.; Brieux, J. A. *J. Am. Chem. Soc.* **1961**, 84, 1026). The authentic material had identical nmr and LCMS characteristics to **2a**.

2b 2-(1-pyrrolidinyl)-5-nitro-benzoic acid, methyl ester

Found: C, 57.58; H, 5.52; N, 11.07. $C_{12}H_{14}N_2O_4$ requires, C, 57.59; H, 5.64; N, 11.19. 1H NMR (400 MHz $CDCl_3$) δ 8.50 (1H, d, J = 3 Hz), 8.13 (1H, dd, J = 10, 3 Hz), 6.71 (1H, d, J = 10 Hz), 3.92 (3H, s), 3.35 (4H, m), 2.01 (4H, m). ^{13}C NMR (100 MHz $CDCl_3$) δ 167.3, 150.9, 135.9, 128.5, 127.1, 115.1, 113.1, 52.5, 51.2, 25.7. HRMS $[M+H]^+$ 251.1014.

2c 2-(1-piperidiny)- 5-nitro-benzoic acid, methyl ester

Literature: Mohrle, H.; Busch, M. *Arch. Pharm.* **1982**, 315, 119.

Found: C, 59.05; H, 5.76; N, 10.13. $C_{13}H_{16}N_2O_4$ requires, C, 59.08; H, 6.10; N, 10.60. 1H NMR (400 MHz $CDCl_3$) δ 8.56 (1H, d, J = 3 Hz), 8.16 (1H, dd, J = 9, 3 Hz), 6.95 (1H, d, J = 9 Hz), 3.96 (3H, s), 2.88 (6H, s), 2.39 (3H, s). ^{13}C NMR (100 MHz $CDCl_3$) δ 167.0, 156.2, 138.2, 128.8, 127.6, 119.5, 117.1, 52.5, 52.4, 25.8, 23.8. HRMS $[M+H]^+$ 265.1178

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Found: C, 51.73; N, 11.79. $C_{10}H_4D_8N_2O_4$ requires C, 51.71; N, 11.19. 1H NMR (500 MHz $CDCl_3$) δ 6.87 (1H, s), 3.96 (3H, s). 2D NMR (77 MHz $CHCl_3$) δ 8.55 (s), 8.15 (s), 2.96 (s). HRMS $[M+H]^+$ 233.1368. Required: 233.1365.