Phase-Transfer Catalyzed Additions; III[1]. Addition of *N*-Diphenylmethylenebenzylamine to Schiff Bases

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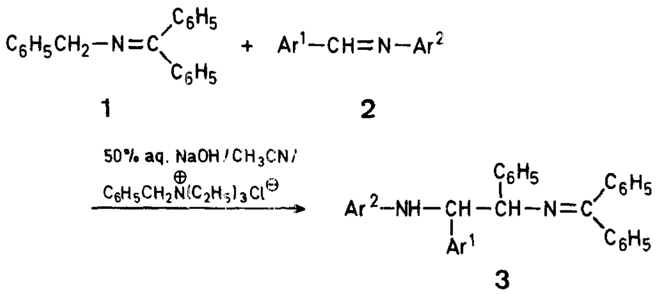
Schiff bases, possessing a methyl or methylene group adjacent to the nitrogen atom and, therefore, generating azaallyl carbanions under basic conditions, are useful intermediates in organic synthesis[2-6]. However, *N*-diphenylmethylenebenzylamine **1** has been relatively little used. Its sodium salt, obtained in tetrahydrofuran in the presence of lithium dialkylamides, is known to react with butadiene giving 2,2,5-triphenyl-3-vinylpyrrolidine[7] in 35% yield. The sodium salt, prepared in liquid ammonia by means of sodium amide[5] or in hexamethylphosphoric triamide by sodium hydride[6], reacts with aromatic aldehydes and aroyl halides to yield the corresponding hydroxyalkylation or aroylation derivatives, respectively.

Now we report that the carbanion of **1** can be easily generated under phase-transfer catalysis conditions using aqueous sodium hydroxide in the presence of catalytic amount of benzyltriethylammonium chloride (TEBA). The reaction of the carbanion of **1** with benzylideneaniline (**2a**) and the Schiff bases **2b–g** gives derivatives of 1,2-diaryl-1,2-ethanediamines **3a–g** (Table).

The reactions were performed at room temperature in acetonitrile solution. In the cases of **3a** and **3c**, the reaction mixtures crystallized completely in 5–10 min. In all other cases more than 30 min were needed for complete crystallization. However, longer reaction times are not suitable because of side reactions.



Attempts to react **1** with *N*-diphenylmethyleneaniline under these conditions failed.

Addition of *N*-Diphenylmethylenebenzylamine (1) to Schiff Bases: 2; General Procedure:

Aqueous sodium hydroxide (50 %, 3 ml) is added to the magnetically stirred solution of *N*-diphenylmethylenebenzylamine (**1**; 2.70 g, 10 mmol), the Schiff base **2** (10 mmol), and benzyltriethylammonium chloride (0.12 g, 0.5 mmol) in acetonitrile (5 ml). The mixture is stirred at room temperature for 10 min, water (100 ml) is added and the mixture is extracted with ether (3 × 30 ml). After drying with sodium sulfate, the solvent is removed and the residue is taken up in ethanol (25 ml) and reevaporated to give a solid which is recrystallized from ethanol/ethyl acetate. In the cases of **3a** and **3c**, the precipitate is filtered, washed with water until neutral, and recrystallized (Table).

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Table. 1,2-Diaryl-1,2-ethanediamines **3** prepared

Compound	Ar^1	Ar^2	Yield [%]	m.p. [°C][a]	Molecular formula[b]	I.R. ($CHCl_3$) $\nu_{NH, C=N}$ [cm^{-1}]	^1H-N.M.R. ($CDCl_3$/TMS)[c] δ [ppm]
3a	C_6H_5	C_6H_5	71	141–143°	$C_{33}H_{28}N_2$ (452.6)	3430, 1625	4.69 (d, 1H, J = 12 Hz); 4.73 (d, 1H, J = 12 Hz); 5.40 (br.s, 1H)[d]; 6.2–7.3 (m, 25H)
3b	4-Cl—C_6H_4	C_6H_5	67	139–141°	$C_{33}H_{27}N_2Cl$ (487.1)	3450, 1630	4.63 (d, 1H, J = 10.5 Hz); 4.67 (d, 1H, J = 10.5 Hz); 5.36 (br.s, 1H)[d]; 6.3–7.7 (m, 24H)
3c	C_6H_5	4-Cl—C_6H_4	79	163–165°	$C_{33}H_{27}N_2Cl$ (487.1)	3450, 1625	4.65 (d, 1H, J = 7.5 Hz); 4.69 (d, 1H, J = 7.5 Hz); 5.61 (br.s. 1H)[d]; 6.2–7.7 (m, 24H)
3d	4-H_3C—C_6H_4	C_6H_5	20 (38)[e]	127–129°	$C_{34}H_{30}N_2$ (466.6)	3450, 1630	2.28 (s, 3H); 4.66 (d, 1H, J = 9.75 Hz); 4.71 (d, 1H, J = 9.75 Hz); 5.52 (br.s, 1H)[d]; 6.2–7.7 (m, 24H)
3e	C_6H_5	4-H_3C—C_6H_4	50 (63)[e]	160–162°	$C_{34}H_{30}N_2$ (466.6)	3450, 1635	2.17 (s, 3H); 4.67 (d, 1H, J = 10.5 Hz); 4.71 (d, 1H, J = 10.5 Hz); 5.47 (br.s, 1H)[d]; 6.2–7.7 (m, 24H)
3f	4-H_3CO—C_6H_4	C_6H_5	42	118–120°	$C_{34}H_{30}N_2O$ (482.6)	3440, 1630	3.71 (s, 3H); 4.63 (d, 1H, J = 9.75 Hz); 4.67 (d, 1H, J = 9.75 Hz); 5.45 (br.s, 1H)[d]; 6.1–7.7 (m, 24H)
3g	C_6H_5	4-H_3CO—C_6H_4	53	141–143°	$C_{34}H_{30}N_2O$ (482.6)	3430, 1625	3.63 (s, 3H); 4.63 (d, 1H, J = 9 Hz); 4.67 (d, 1H, J = 9 Hz); 5.17 (br.s, 1H)[d]; 6.1–7.7 (m, 24H)

[a] Recrystallized from ethanol/ethyl acetate.

[b] Satisfactory microanalyses obtained: C ±0.19, H ±0.11, N ±0.18.

[c] Measured with JEOL PS-100 spectrometer.

[d] Disappeared after D_2O exchange.

[e] Reaction time 1 h.

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