Pergamon

Tetrahedron 54 (1998) 12007–12028

TETRAHEDRON

Imidoyl Chlorides as Starting Materials for the Preparation of Masked Acyllithium Intermediates: Synthetic Applications

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Received 11 June 1998; revised 17 July 1998; accepted 22 July 1998

Abstract

The lithiation of several imidoyl chlorides **5**, catalysed by substoichiometric amounts of naphthalene, followed by reaction with different electrophiles gives, after hydrolysis, the corresponding imine derivatives **6** and **9** or amines **7**, depending on the reaction conditions. The imine derivatives are easily converted into the corresponding ketones by treatment either with dilute hydrochloric acid, for *N*-aryl derivatives, or with silica gel, for *N*-alkyl derivatives. The hydroxyimines obtained react with $LiAlH_4$ to give the corresponding 1,2-aminoalcohols, as a single diastereoisomer. The same result is found when the imine moiety is *in situ* reduced with lithium. The 1,2-aminoalcohols obtained are easily transformed into the corresponding 1,3-oxazolidines **11** by reaction with *para*-formaldehyde under acidic catalysis.

Keywords: Lithiation; Arenes; Imidoyl halides; Oxazolidines

I. Introduction

Acyllithium reagents [1], which play a central role in the synthesis of functionalised organolithium compounds [2-4], can be described as an equilibrium between the acyllithium anion and the corresponding oxy-carbene structure [1]. The corresponding imidoyllithium derivatives (**1**) can act as a masked acyl function, being also described as an equilibrium

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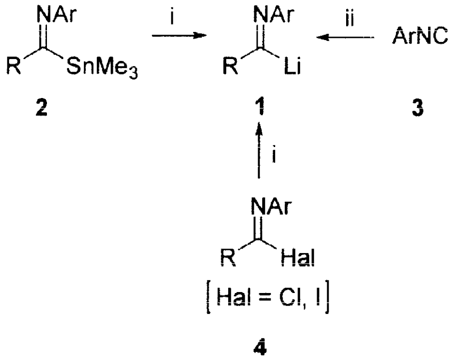
PII: S0040-4020(98)00705-4

between the anion form and the amino-carbene structure [5]. There are only two main ways to prepare these imidoyllithium reagents: (a) tin-lithium exchange (**2**) [6,7] and (b) addition of an organolithium reagent to an isonitrile (**3**) [8-14]. In both cases, the process is almost limited to *N*-aryl derivatives and it is necessary to use the corresponding *N*-2,6-dimethylphenyl derivatives in order to avoid *o*-lithiation. In addition, the preparation of these imidoyllithium reagents by deprotonation is unknown,[1] the only case of forming this type of reagents by chlorine- or iodine-lithium exchange using *n*-butyllitium having only been described for the corresponding trifluoromethyl derivatives (**4**) (see Scheme 1) [16-17].[2]

On the other hand, we have previously described the preparation of carbamoyl- and thiocarbamoyllithium reagents [19,20] by an arene-catalysed lithiation process [21] from the corresponding carbamoyl chlorides. These considerations prompted us to study the possibility of preparing different imidoyllithium derivatives by a direct reductive lithiation process. Thus, in this paper we describe the first example of the direct transformation of different imidoyl chlorides into the corresponding imidoyllithium reagents and its application to the synthesis of 1,2-functionalised compounds.[3]



Scheme 1. *Reagents:* i, Bu^{n}Li; ii, PhLi or MeLi.

II. Results and discussion

The reaction of different imidoyl chlorides **5** with an excess of lithium powder and a catalytic amount of naphthalene (4 mol%) in THF at -78°C led to a solution of the corresponding imidoyllithium intermediate of type **1**, which by treatment with different electrophiles, such as aldehydes, ketones and chloroformate derivatives, at temperatures ranging between -78 and 20°C, followed by hydrolysis with water, afforded the expected

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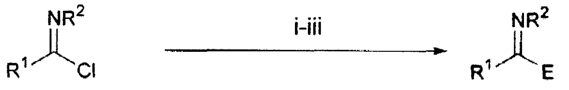
[1] For an example of preparation of acyllithium reagents by deprotonation of aldehydes, see reference [15].

[2] For an example of metal free imidoyl carbanion derivative, see reference [18].

[3] For a preliminary communication, see reference [22].

imines **6** as a single isomer (Scheme 2 and Table 1). The configuration of the carbon-nitrogen double bound was assumed to be *Z* following the literature data [22].



5a: R^1 = Bu^t, R^2 = 2,6-Me$_2$C$_6$H$_3$
5b: R^1 = Bu^t, R^2 = n-C$_8$H$_{17}$
5c: R^1 = n-C$_6$H$_{13}$, R^2 = 2,6-Me$_2$C$_6$H$_3$
5d: R^1 = c-C$_6$H$_{13}$, R^2 = 2,6-Me$_2$C$_6$H$_3$

6a-q

Scheme 2. *Reagents and conditions:* i, Li, C$_{10}$H$_8$ cat. (4 mol %), THF, -78°C (for compound **5a**, after 2 h filtration); ii, E$^+$ = Pr^{i}CHO, Bu^{t}CHO, n-C$_5$H$_{11}$CHO, PhCHO, Et$_2$CO, (CH$_2$)$_5$CO, EtOCOCl, [CH$_2$O(CH$_2$)$_2$OCOCl]$_2$, MeOCSCl, n-C$_7$H$_{15}$CON(Me)OMe; iii, H$_2$O.

Table 1
Preparation of imine derivatives **6**

Entry	Starting material	E$^+$	Product^a No.	R^1	R^2	E	Yield (%)^b
1	**5a**	Pr^{i}CHO	**6a**	Bu^t	2,6-Me$_2$C$_6$H$_3$	Pr^{i}CH(OH)	36
2	**5a**	Bu^{t}CHO	**6b**	Bu^t	2,6-Me$_2$C$_6$H$_3$	Bu^{t}CH(OH)	63
3	**5a**	PhCHO	**6c**	Bu^t	2,6-Me$_2$C$_6$H$_3$	PhCH(OH)	45
4	**5a**	Et$_2$CO	**6d**	Bu^t	2,6-Me$_2$C$_6$H$_3$	Et$_2$C(OH)	60
5	**5a**	(CH$_2$)$_5$CO	**6e**	Bu^t	2,6-Me$_2$C$_6$H$_3$	(CH$_2$)$_5$C(OH)	50
6	**5a**	EtOCOCl	**6f**	Bu^t	2,6-Me$_2$C$_6$H$_3$	EtOCO	52
7	**5a**	n-C$_7$H$_{15}$CON(Me)OMe	**6g**	Bu^t	2,6-Me$_2$C$_6$H$_3$	n-C$_7$H$_{15}$CO	26
8	**5b**	Pr^{i}CHO	**6h**	Bu^t	n-C$_8$H$_{17}$	Pr^{i}CH(OH)	(32)^c
9	**5b**	Bu^{t}CHO	**6i**	Bu^t	n-C$_8$H$_{17}$	Bu^{t}CH(OH)	(48)^c
10	**5b**	n-C$_5$H$_{11}$CHO	**6j**	Bu^t	n-C$_8$H$_{17}$	n-C$_5$H$_{11}$CH(OH)	(61)^c
11	**5b**	PhCHO	**6k**	Bu^t	n-C$_8$H$_{17}$	PhCH(OH)	(43)^c
12	**5b**	EtOCOCl	**6l**	Bu^t	n-C$_8$H$_{17}$	EtOCO	72
13	**5b**	[CH$_2$O(CH$_2$)$_2$OCOCl]$_2$	**6m**	Bu^t	n-C$_8$H$_{17}$	[CH$_2$O(CH$_2$)$_2$OCO]$_2$	(45)^{c,d}
14	**5c**	EtOCOCl	**6n**	n-C$_6$H$_{13}$	2,6-Me$_2$C$_6$H$_3$	EtOCO	80
15	**5d**	Bu^{t}CHO	**6o**	c-C$_6$H$_{11}$	2,6-Me$_2$C$_6$H$_3$	Bu^{t}CH(OH)	76
16	**5d**	EtOCOCl	**6p**	c-C$_6$H$_{11}$	2,6-Me$_2$C$_6$H$_3$	EtOCO	65
17	**5d**	MeOCSCl	**6q**	c-C$_6$H$_{11}$	2,6-Me$_2$C$_6$H$_3$	MeOCS	41

[a] All products **6** were >90% pure (GLC and 300 MHz ^{1}H NMR).

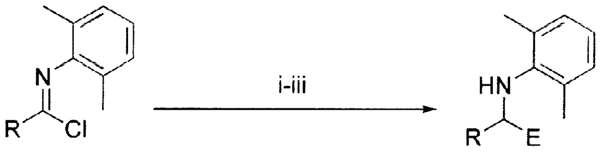
[b] Isolated yield after column chromatography (silica gel, hexane/ethyl acetate) except otherwise stated, based on the starting material **5**.

[c] Crude yield; this compound decomposed during the purification by column chromatography giving mainly the corresponding ketone **10**.

[d] Yield corresponding to the transformation 2 **5b** → **6m** → **10g**.

In the case of using the imidoyl chloride **5a** it was necessary to filter off the excess of lithium powder prior to the addition of electrophile in order to avoid the final reduction of the imine moiety[4] (Table 1, entries 1-7). In the case of using the *N*-alkylimidoyl chloride **5b**, the corresponding products **6h-k** and **6m** were unstable and after chromatographic purification only deprotected materials of type **10** could be isolated (Table 1, entries 8-11 and 13). However, with the former imidoyllithium reagent (**5b**) but using ethyl chloroformate as electrophile, the corresponding imine compound **6l** was isolated (Table 1, entry 12). Even when the reaction was performed with the imidoyl chlorides **5c** and **5d**, having enolisable protons, the expected imine derivatives **6n-q** were isolated (Table 1, entries 14-17).

When the reaction with starting materials **5a,d** was performed without filtering off the excess of lithium powder and allowing the temperature to rise to room temperature, after adding the electrophile, the expected amine derivatives **7** were isolated (Scheme 3 and Table 2). From a mechanistic point of view, the preparation of the amino compounds **7** can be explained by a naphthalene-catalysed lithiation of imidoylchloride **5**, to give the corresponding imidoyllithium **1**, followed by reaction with the electrophile affording the product **6**, which by lithium addition to the carbon-nitrogen double bond [23] and final hydrolysis, give the product **7**.



5a: R = Bu^t
5d: R = c-C_6H_{13}

7a-i

Scheme 3. *Reagents and conditions:* i, Li, $C_{10}H_8$ cat. (4 mol %), THF, -78°C; ii, E^+ = Bu^tCHO, PhCHO, Et_2CO, $(CH_2)_5CO$, PhCOMe, EtOCOCl, (-)-menthyl-OCOCl, -78 to 20°C; iii, H_2O.

In the case of using aldehydes or prostereogenic ketones as electrophiles, the corresponding 1,2-amino alcohols were isolated as a single diastereoisomer (Table 2, entries 1, 2, 4 and 7). However, when the chiral chloroformate derived from (-)-menthol was used as electrophile a mixture (1:1) of both diastereoisomeric α-aminoesters **7f** was isolated (entry 6, Table 2). When the imidoylchloride **5a** was used as starting material and pivalaldehyde as electrophile, besides the expected aminoalcohol **7a**, the aminodiol **8** was isolated (21% yield) as a single diastereoisomer. This diol **8** arised from the successive reaction of the α-iminolithium derivative of type **1** with pivalaldehyde, followed by lithiation to give the corresponding α-aminolithium reagent and final reaction with a second equivalent of pivalaldehyde (Table 2, entry 1). When the reaction was repeated under the same conditions but using a large excess of

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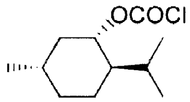
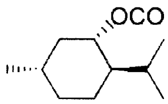
[4] For an example of preparation of α-functionalised organolithium reagents from phenone imine derivatives by addition of lithium to the carbon-nitrogen double bond, see reference [23].

pivaldehyde the diol **8** was isolated in only 35% yield, the aminoalcohol **7a** also being obtained with 30% yield. The naphthalene-catalysed lithiation of the imidoyl chloride **5d** gave a mixture of the expected aminoalcohol **7g** and the hydroxyimine **6r** in *ca.* 1:1 molar ratio, indicating that the addition of lithium to carbon-nitrogen double bound was slower than in the other cases.

Table 2
Preparation of compounds 7

	Starting material		Product[a]			
Entry	No.	E^+	No.	R	E	Yield (%)[b]
1	**5a**	$\mathrm{Bu^tCHO}$	**7a**	$\mathrm{Bu^t}$	$\mathrm{Bu^tCH(OH)}$	45[c]
2	**5a**	PhCHO	**7b**	$\mathrm{Bu^t}$	PhCH(OH)	10[d]
3	**5a**	$\mathrm{(CH_2)_5CO}$	**7c**	$\mathrm{Bu^t}$	$\mathrm{(CH_2)_5C(OH)}$	46
4	**5a**	PhCOMe	**7d**	$\mathrm{Bu^t}$	PhC(OH)Me	32[e]
5	**5a**	EtOCOCl	**7e**	$\mathrm{Bu^t}$	EtOCO	30
6	**5a**		**7f**	$\mathrm{Bu^t}$		30[f]
7	**5d**	PhCHO	**7g**	$c\text{-}C_6H_{11}$	PhCH(OH)	40[g]
8	**5d**	$\mathrm{Et_2CO}$	**7h**	$c\text{-}C_6H_{11}$	$\mathrm{Et_2C(OH)}$	42
9	**5d**	$\mathrm{(CH_2)_5CO}$	**7i**	$c\text{-}C_6H_{11}$	$\mathrm{(CH_2)_5C(OH)}$	25

[a] All products 7 were >90% pure (GLC and 300 MHz ^{1}H NMR).

[b] Isolated yield after column chromatography (silica gel, hexane/ethyl acetate) based on the starting material 5.

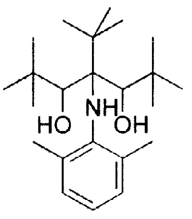
[c] Compound **8** was also isolated (21%), see text.

[d] Compound **9a** was also isolated (45%), see text and Scheme 4.

[e] Only the *u*-diastereoisomer was detected.

[f] Mixture of diastereoisomers (*ca.* 1:1).

[g] Compound **6r** was also isolated (38%), see text.



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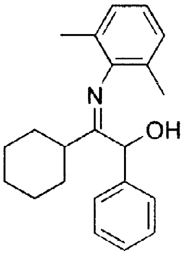
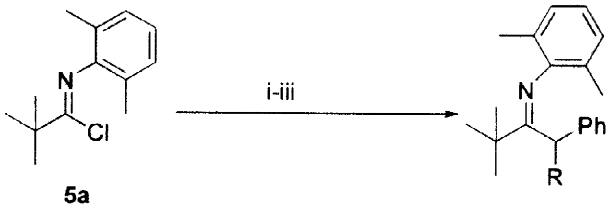


6r

The low yield found when the imidoyl chloride **5a** and benzaldehyde were used in the above mentioned reaction (Scheme 2) was due to the reductive cleavage of the lithium alkoxide to form the corresponding enolate derivative, which led after hydrolysis to the imine **9a** in 45% yield. When benzophenone was used instead of benzaldehyde, the only isolated product was the dehydroxyimine **9b** (Scheme 4). A similar reductive cleavage of a lithium alkoxide was previously described [24].

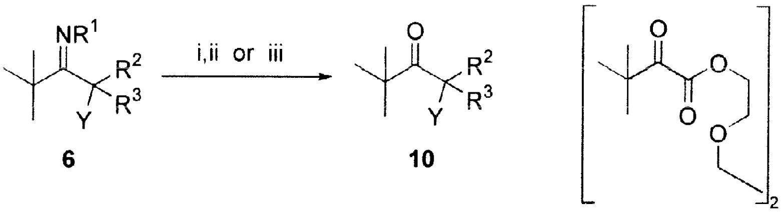


5a

9a: R = H (45%)
9b: R = Ph (35%)

Scheme 4. *Reagents and conditions*: i, Li, $C_{10}H_8$ cat. (4 mol %), THF, -78°C; ii, E^+ = PhCHO, PhCOPh, -78 to 20°C; iii, H_2O.

Whereas *N*-arylimines **6** were easily hydrolysed to the corresponding ketones, by reaction with 2M hydrochloric acid in THF at room temperature, in the case of *N*-alkylimines the chromatographic isolation yielded directly the expected ketones **10** (Scheme 5 and Table 3).



6 **10** **10g**

Scheme 5. *Reagents and conditions*: i, 2M HCl, THF, 20°C; ii, H_2O; iii, silica gel, hexane.

Table 3
Hydrolysis of imine compounds. Preparation of ketones **10**

	Starting imine		Ketone[a]				
Entry	No.	R^1	No.	Y	R^2	R^3	Yield (%)[b]
1	**6c**	2,6-$Me_2C_6H_3$	**10a**	OH	H	Ph	95
2	**6e**	2,6-$Me_2C_6H_3$	**10b**	OH	-$(CH_2)_5$-		91
3	**6g**	2,6-$Me_2C_6H_3$	**10c**	-O-		*n*-C_7H_{15}	95
4	**6h**	*n*-C_8H_{17}	**10d**	OH	H	Pr^i	23[c]
5	**6i**	*n*-C_8H_{17}	**10e**	OH	H	Bu^t	37[c]
6	**6j**	*n*-C_8H_{17}	**10f**	OH	H	*n*-C_5H_{11}	51[c]
7	**6k**	*n*-C_8H_{17}	**10a**	OH	H	Ph	31[c]
8	**6m**	*n*-C_8H_{17}	**10g**	-[d]	-[d]	-[d]	35[c]
9	**9a**	2,6-$Me_2C_6H_3$	**10h**	H	H	Ph	90

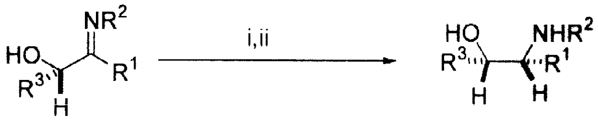
[a] All products **10** were >95% pure (GLC and 300 MHz ^1H NMR).

[b] Isolated yield after column chromatography (silica gel, hexane/ethyl acetate) based on the starting material **6** or **9**.

[c] Overall yield based on the imidoyl chloride **5**.

[d] See Scheme 5.

The reduction of several hydroxyamines **6** with $LiAlH_4$ in THF at room temperature yielded the expected 1,2-aminoalcohols **7** as pure single diastereoisomers (Scheme 6 and Table 4).



6 **7**

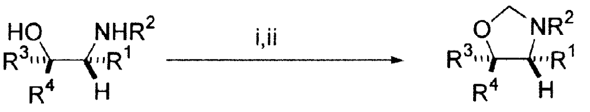
Scheme 6. *Reagents and conditions*: i, $LiAlH_4$, THF, 20°C; ii, H_2O.

Table 4
Reduction of hydroxyimines. Preparation of aminoalochols 7

Entry	Imine	Product[a]				
		No.	R^1	R^2	R^3	Yield (%)[b]
1	**6h**	**7j**	Bu^t	$CH_3(CH_2)_7$	Pr^i	77
2	**6i**	**7k**	Bu^t	$CH_3(CH_2)_7$	Bu^t	80
3	**6j**	**7l**	Bu^t	$CH_3(CH_2)_7$	$CH_3(CH_2)_4$	85
4	**6k**	**7m**	Bu^t	$CH_3(CH_2)_7$	Ph	90
5	**6o**	**7n**	$(CH_2)_5CH$	2,6-$Me_2C_6H_3$	Bu^t	70

[a] All products **7** were >95% pure (GLC and 300 MHz ^1H NMR).
[b] Isolated yield after column chromatography (silica gel, hexane/ethyl acetate), based on the starting material **6**.

Finally, oxazolidines **11** were prepared from 1,2-aminoalcohols **7** by cyclisation with *para*-formaldehyde under acidic catalysis (Scheme 7 and Table 5). The relative configuration of oxazolidines **11**, and therefore the relative configuration of starting aminoalcohols **7**, was determined by n.O.e and/or NOESY experiments, in all cases tested the relative configurationbeing *cis*, so the starting aminoalcohols **7** are *u*-diastereoisomers.[5] The relative configuration obtained is independent of the procedure used for preparing the 1,2-aminoalcohols: in both cases, addition of lithium to carbon-nitrogen double bond (Scheme 3) or reduction by $LiAlH_4$, yielded the *u*-1,2-aminoalcohol **7**. This relative *u*-configuration can be explained following the chelated Cram model [26-28], in which the attack of the reduction agent takes place from the less hindered face in the chelated intermediate of type **12**.



7 **11**

Scheme 7. *Reagents and conditions*: i, $(CH_2O)_n$, *p*-TsOH (cat.), PhMe, 110°C; ii, H_2O.

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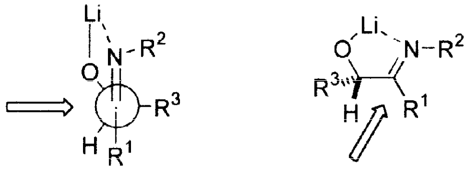
[5] For *u*, *l* and *ul*, *lk* descriptors of relative configuration and topicity on acyclic compounds, see reference [25].

Table 5
Preparation of oxazolidines **11**

Entry	1,2-amino alcohol	Oxazolidines[a]					
		No.	R^1	R^2	R^3	R^4	Yield (%)[b]
1	**7a**	**11a**	Bu^t	2,6-$Me_2C_6H_3$	Bu^t	H	85
2	**7d**	**11b**	Bu^t	2,6-$Me_2C_6H_3$	Ph	Me	55
3	**7j**	**11c**	Bu^t	$CH_3(CH_2)_7$	Pr^i	H	87
4	**7k**	**11d**	Bu^t	$CH_3(CH_2)_7$	Bu^t	H	95
5	**7l**	**11e**	Bu^t	$CH_3(CH_2)_7$	$CH_3(CH_2)_4$	H	98
6	**7m**	**11f**	Bu^t	$CH_3(CH_2)_7$	Ph	H	86
7	**7n**	**11g**	c-C_6H_{11}	2,6-$Me_2C_6H_3$	Bu^t	H	90
8	**7g**	**11h**	c-C_6H_{11}	2,6-$Me_2C_6H_3$	Ph	H	65

[a] All products **11** were >95% pure (GLC and 300 MHz ^1H NMR).
[b] Isolated yield based on the starting material **7**.



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III. Conclusion

In conclusion, we have described here a new and simple method to prepare imidoyllithium intermediates, by a naphthalene-catalysed chlorine-lithium reductive exchange. These imidoyllithium reagents are acyllithium synthetic equivalents and allow the preparation of different 1,2-bifunctionalised compounds, such as hydroxyimines, ketoimines, iminoesters, aminoalcohols, aminoesters, hydroxyketones and diketones.

IV. Experimental section

IV.1. General

For general information see reference [29]. All starting amides were prepared from the corresponding acid chloride and amine under standard conditions [30]. The chromatographic analyses (GLC) were determined with a Hewlett Packard HP-5890 instrument equipped with a flame ionisation detector and a 12 m HP-1 capillary column (0.2 mm diam, 0.33 mm film thickness, OV-1 stationary phase), using nitrogen (2 ml/min) as carrier gas, $T_{injector}$=275°C,

$T_{detector}$=300°C, T_{column}=60°C (3 min) and 60-270°C (15°C/min), P=40 kPa; t_r values are given in min under these conditions.

IV.2. Preparation of starting imidoyl chlorides **5**

General procedure [30].- A mixture of amide (5 mmol) and phosphorus pentachloride (1.06 g, 5 mmol) in toluene (5 ml) under an argon atmosphere was refluxed for 3 h. Solvent was evaporated (0.1 Torr) and the residue was distilled in the case of derivative **5a** (0.1 Torr, 160°C). For derivatives **5b-d** the crude products were used without further purification.

N-*(2,6-Dimethylphenyl)-1-chloro-2,2-dimethyl-1-propanamide* (**5a**) [32]: Pale yellow oil, R_f 0.20 (hexane/ethyl acetate: 6/1); t_r 10.53; ν (film) 3070, 3041, 1594 (C=C), 1699 cm^{-1} (C=N); δ_H 1.41 [9H, s, $(CH_3)_3C$], 2.03 [6H, s, $(CH_3)_2C_6H_3$], 6.85-7.00 (3H, m, ArH); δ_C 17.5 [$(CH_3)_2C_6H_3$], 28.4 [$(CH_3)_3C$], 43.75 [$C(CH_3)_3$], 123.8, 126.0, 127.65, 145.45 (ArC), 155.55 (C=N); *m/z* 225 (M^++2, 7%), 224 (M^++1, 3), 223 (M^+, 21), 188 (61), 133 (15), 132 (100), 130 (18), 117 (17), 105 (20), 79 (19), 78 (11), 77 (35), 57 (30), 51 (14), 44 (13).

IV.3. Naphthalene catalysed lithiation of imidoyl chlorides **5**. *Reaction with electrophiles. Isolation of compounds* **6**.

General procedure.- To a green suspension of lithium powder (100 mg, 14 mmol) and naphthalene (10 mg, 0.08 mmol) in THF was slowly added (*ca.* 10 min) a solution of the corresponding imidoyl chloride **5** in THF (2 ml). Stirring was continued for 2 h in the case of **5a**, **5c-d** derivatives and for 1 h in the case of **5b**. Then, a solution of the corresponding electrophile (1.2 mmol) in THF (2 ml) was added. In the case of **5a** the excess of lithium was filtered off before the addition of electrophile. The resulting mixture was stirred at -78°C or allowing the temperature to rise to 20°C for 1 to 8 h.[6] The resulting mixture was then hydrolysed with water (5 ml) and extracted with ethyl acetate (2x20 ml). The organic layer was dried over anhydrous Na_2SO_4 and the solvents were evaporated (15 Torr) to give a residue, wich was purified by column chromatography (silica gel, hexane/ethyl acetate) affording the pure title compounds. In the case of compounds **6h-k** and **6m**, after chromatographic purification only deprotected materials **10d-h** were isolated. Yields are included in Table 1 and in the text. Physical, spectroscopic and analytical data follow.

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[6] 1 h at -78°C for compound **6k**; 1.5 h at -78°C for compounds **6h-j**, 2 h at -78°C for 8 h for compounds **6a-g**.and 3 h for compounds **6l,m,q**, 3 h at -78°C for compounds **6o,r**. 3 h from -78 to 20°C for compounds for compounds **6n,p**; 8 h from -78 to 20°C for compounds **6a-g**.

4-(2,6-Dimethylphenylimino)-2,5,5-trimethyl-3-hexanol (**6a**): Pale yellow oil, R_f 0.35 (hexane/ethyl acetate: 9/1); t_r 12.88; ν (film) 3535 (OH), 3060, 1596 (HC=C), 1672 cm^{-1} (C=N); δ_H 0.96 (3H, d, *J*=6.7, CH_3CH), 1.10 [13H, br. s, $(CH_3)_3C$, OH, CH_3CH], 2.03, 2.07 [3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$], 2.10-2.20 [1H, m, $CH(CH_3)_2$], 4.25 (1H, s, CHO), 6.83, 6.96 (1 and 2H, respectively, t and d, respectively, *J*=7.4, ArH); δ_C 18.65 [$(CH_3)_2C_6H_3$], 19.15, 21.2 [$(CH_3)_2CH$], 28.35 [$(CH_3)_3C$], 32.35 [$CH(CH_3)_2$] 40.95 [$C(CH_3)_3$], 75.7 (CO), 122.0, 123.2, 124.4, 127.7, 127.85, 147.85 (ArC), 177.5 (C=N); *m/z* 261 (M^+, 1%), 188 (41), 133 (11), 132 (100), 105 (13), 79 (10), 77 (13), 57 (43), 43 (28) (Found: M^+, 261.2083. $C_{17}H_{27}NO$ requires 261.2092).

4-(2,6-Dimethylphenylimino)-2,2,5,5-tetramethyl-3-hexanol (**6b**): Pale yellow oil, R_f 0.37 (hexane/ethyl acetate: 19/1); t_r 13.45; ν (film) 3563 (OH), 3065, 1594, 1473 (HC=C), 1666 cm^{-1} (C=N); δ_H 1.05, 1.11 [9 and 9H, respectively, 2s, 2x$(CH_3)_3C$], 2.05, 2.09 [3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$], 2.20-2.55 (1H, m, OH), 4.14 (1H, d, *J*=11.3, CHO), 6.75-6.85, 6.90-6.95 (1 and 2H, respectively, 2m, ArH); δ_C 18.65, 19.65 [$(CH_3)_2C_6H_3$], 27.05, 28.2 [2x$(CH_3)_3C$], 36.55, 42.8 [2x$C(CH_3)_3$], 76.55 (CO), 121.35, 122.45, 123.15, 127.6, 148.2 (ArC), 178.8 (C=N); *m/z* 276 (M^++1, 1%), 275 (M^+, 5), 188 (45), 133 (14), 132 (100), 117 (12), 105 (14), 79 (12), 77 (12), 57 (35) (Found: M^+, 275.2252. $C_{18}H_{29}NO$ requires 275.2249).

2-(2,6-Dimethylphenylimino)-3,3-dimethyl-1-phenyl-1-butanol (**6c**): Pale yellow oil R_f 0.27 (hexane/ethyl acetate: 9/1); t_r 15.67; ν (film) 3403 (OH), 3063, 3028, 1593, 1472 (HC=C), 1668 cm^{-1} (C=N); δ_H 0.98 [9H, s, $(CH_3)_3C$], 2.08 [7H, br. s, $(CH_3)_2C_6H_3$, OH], 5.43 (1H, s, CHO), 6.80-6.90, 6.95-7.05, 7.20-7.50 (1, 2 and 5H, respectively, 3m, ArH); δ_C 18.7 [$(CH_3)_2C_6H_3$], 28.7 [$(CH_3)_3C$], 41.1 [$C(CH_3)_3$], 73.6 (CO), 122.45, 123.7, 127.75, 127.85, 128.5, 147.2 (ArC), 176.1 (C=N); *m/z* 295 (M^+, 1%), 188 (57), 133 (12), 132 (100), 117 (10), 105 (18), 79 (14), 77 (21), 57 (31) (Found: M^+, 295.1928. $C_{20}H_{25}NO$ requires 295.1936).

4-(2,6-Dimethylphenylimino)-3-ethyl-5,5-dimethyl-3-hexanol (**6d**): Pale yellow oil, R_f 0.51 (hexane/ethyl acetate: 9/1); t_r 14.02; ν (film) 3423 (OH), 3128, 1593, 1466 (HC=C), 1650 cm^{-1} (C=N); δ_H 1.00 (6H, t, *J*=7.3, 2xCH_3CH_2), 1.16 [9H, s, $(CH_3)_3C$], 1.80-2.00 (4H, m, 2xCH_2CH_3), 2.05 [6H, s, $(CH_3)_2C_6H_3$], 5.55 (1H, s, OH), 6.84, 6.97 (1 and 2H, respectively, t and d, respectively, *J*=7.3, ArH); δ_C 9.0 (2xCH_3CH_2), 19.4 [$(CH_3)_2C_6H_3$], 29.25 [$(CH_3)_3C$], 32.83 (2xCH_2CH_3), 40.85 [$C(CH_3)_3$], 81.15 (CO), 121.9, 123.35, 127.85, 147.8 (ArC), 178.7 (C=N); *m/z* 275 (M^+, 2%), 188 (41), 133 (10), 132 (100), 105 (12), 77 (10), 57 (32) (Found: M^+, 275.2245. $C_{18}H_{29}NO$ requires 275.2249).

1-[1-(2,6-Dimethylphenylimino)-2,2-dimethylpropyl]-1-cyclohexanol (**6e**): Pale yellow oil, R_f 0.42 (hexane/ ethyl acetate: 9/1); t_r 15.18; ν (film) 3583 (OH), 3061, 1594, 1496 (HC=C), 1661 cm^{-1} (C=N); δ_H 1.16 [9H, s, $(CH_3)_3C$], 1.55-1.85 (10H, m, 5xCH_2), 2.02 [6H, s, $(CH_3)_2C_6H_3$], 3.82 (1H, br. s, OH), 6.76 (1H, t, *J*=7.4, ArH), 6.93 (2H, d, *J*=7.4, ArH); δ_C 18.65

$[(CH_3)_2C_6H_3]$, 22.15, 25.2, 37.5 ($5xCH_2$), 29.45 $[(CH_3)_3C]$, 42.85 $[C(CH_3)_3]$, 78.75 (CO), 120.95, 122.25, 127.45, 148.3 (ArC), 178.75 (C=N); *m/z* 288 (M^++1, 1%), 287 (M^+, 5), 189 (13), 188 (81), 133 (15), 132 (100), 117 (12), 105 (17), 79 (17), 77 (15), 57 (35), 55 (11).

Ethyl 2-(2,6-dimethylphenylimino)-3,3-dimethylbutanoate (**6f**): Pale yellow oil, R_f 0.60 (hexane/ethyl acetate: 9/1); t_r 11.09; ν (film) 1733, 1699 (C=O, C=N), 1472 (HC=C), 1062 cm^{-1} (CO); δ_H 0.87 (3H, t, *J*=7.0, CH_3CH_2), 1.35 [9H, s, $(CH_3)_3C$], 2.04 [7H, s, $(CH_3)_2C_6H_3$, OH], 3.92 (2H, q, *J*=7.0, CH_2), 6.80-6.85, 6.90-6.95 (1 and 2H, respectively, 2m, ArH); δ_C 13.6 (CH_3CH_2), 17.75 $[(CH_3)_2C_6H_3]$, 27.7 $[(CH_3)_3C]$, 38.25 $[C(CH_3)_3]$, 60.5 (CH_2), 123.25, 126.2, 127.4, 147.55 (ArC), 165.25 (C=O), 172.2 (C=N); *m/z* 262 (M^++1, 2%), 261 (M^+, 10), 188 (36), 133 (10), 132 (100), 105 (12), 79 (12), 77 (13), 57 (25), 44 (11) (Found: M^+, 261.1729. $C_{16}H_{23}NO_2$ requires 261.1729).

3-(2,6-Dimethylphenylimino)-2,2-dimethyl-4-undecanone (**6g**): Pale yellow oil, R_f 0.52 (hexane/ethyl acetate: 9/1); t_r 14.21; ν (film) 3018, 1593, 1467 (HC=C), 1703 (C=O), 1644 cm^{-1} (C=N); δ_H 0.80-1.35 [24H, m with s at 1.32, $6xCH_2$, CH_3CH_2, $(CH_3)_3C$], 2.04 [6H, s, $(CH_3)_2C_6H_3$], 6.80-6.85, 6.90-6.95 (1 and 2H, respectively, 2m, ArH); δ_C 14.0 (CH_3CH_2), 18.05 $[(CH_3)_2C_6H_3]$, 21.95, 22.55, 28.6, 28.8, 31.5, 41.75 ($6xCH_2$), 28.05 $[(CH_3)_3C]$, 38.45 $[C(CH_3)_3]$, 123.55, 125.9, 127.85, 128.0, 147.0 (ArC), 179.05 (C=N), 207.75 (CO); *m/z* 315 (M^+, 1%), 189 (16), 188 (89), 133 (14), 132 (100), 105 (15), 57 (41), 43 (13) (Found: M^+, 315.2563. $C_{21}H_{33}NO$ requires 315.2562).

Ethyl 3,3-dimethyl-2-(1-octylimino)butanoate (**6l**): Pale yellow oil, R_f 0.42 (hexane/ethyl acetate: 19/1); t_r 11.70; ν (film) 1731, 1654 (C=O, C=N), 1472 cm^{-1} (HC=C); δ_H 0.88 (3H, t, *J*=6.4, $CH_3CH_2CH_2$), 1.16 [9H, s, $(CH_3)_3C$], 1.20-1.40 [13H, m, $(CH_2)_5CH_3$, CH_3CH_2O], 2.45-2.65 (2H, m, CH_2CH_2N) 3.27 (2H, t, *J*=7.0, CH_2N), 4.31 (2H, q, *J*=7.3, CH_2O); δ_C 14.05, 14.3 ($2xCH_3$), 22.6, 27.2, 29.2, 29.35, 30.6, 31.8 $[(CH_2)_6CH_3]$, 27.75 $[(CH_3)_3C]$, 37.5 $[C(CH_3)_3]$, 54.75 (CH_2N), 60.35 (CH_2O), 166.4 (C=O), 170.05 (C=N); *m/z* 240 (M^+-29, 1%), 196 (55), 85 (11), 84 (100), 71 (39), 57 (83), 56 (12), 55 (23), 44 (14), 43 (60), 42 (17) (Found: M^+-C_2H_5, 240.1972. $C_{14}H_{26}NO_2$ requires 240.1963).

Ethyl 2-(2,6-dimethylphenylimino)octanoate (**6n**):[7] Pale yellow oil, R_f 0.50 (hexane/ethyl acetate: 19/1); t_r 14.45; ν (film) 1739, 1712 (C=O, C=N), 1468 cm^{-1} (HC=C); δ_H 0.88 (3H, t, *J*=6.7, $CH_3CH_2CH_2$), 1.16 (3H, t, *J*=7.0, CH_3CH_2O), 1.20-1.40, 1.60-1.75 [6 and 2H, respectively, 2m, $(CH_2)_4CH_3$], 2.08 [6H, s, $(CH_3)_2C_6H_3$], 2.97 (2H, t, *J*=7.4, CH_2C=N), 4.16 (2H, q, *J*=7.0, CH_2O), 7.05-7.20 (3H, m, ArH); δ_C 13.95, 14.1, 17.6 ($4xCH_3$), 22.5, 24.9, 28.9, 31.55, 37.65 $[(CH_2)_5CH_3]$, 62.65 (CH_2O), 128.05, 128.2, 135.2, 136.55 (ArC), 153.75 (C=N), 174.95 (C=O); *m/z* 248 (M^+-41, 1%), 194 (14), 193 (100), 165 (35), 147 (35), 121 (21), 120 (23), 55 (16), 44 (13), 43 (53).

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[7] For this liquid compound, it was not possible to obtain the corresponding HRMS due to the absence of M^+ signal.

1-Cyclohexyl-1-(2,6-dimethylphenylimino)-3,3-dimethyl-2-butanol (**6o**): Pale yellow oil, R_f 0.51 (hexane/ethyl acetate: 9/1); t_r 16.07; ν (film) 3450 (OH), 1662 (C=N), 1470 cm^{-1} (HC=C); δ_H 0.90-1.20, 1.50-1.80 (13 and 6H, respectively, 2m, $(CH_3)_3C$, $(CH_2)_5$], 2.04, 2.06 (3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$), 2.26 (1H, br. s, $CHCH_2$), 3.50 (1H, br. s, OH), 4.00 (1H, br. s, CHO), 6.80-6.90, 6.95-7.00 (1 and 2H, respectively, 2m, ArH); δ_C 14.15, 18.4, 19.35, 19.9, 21.0, 25.65, 26.05, 26.3, 26.45, 26.65, 26.85, 28.05, 29.0, 35.4, 36.65, 41.8, 46.05 [rotamers, $(CH_3)_2C_6H_3$, $(CH_2)_5CH$, $(CH_3)_3C$], 78.31 (CO), 118.4, 122.65, 124.55, 125.3, 125.45, 127.65, 128.0, 129.3, 147.2, 171.1 (rotamers, ArC), 179.65 (C=N); *m/z* 301 (M^+, 6%), 214 (14), 213 (100), 132 (23) (Found: M^+, 301.2396. $C_{20}H_{31}NO$ requires 301.2405).

Ethyl 2-cyclohexyl-2-(2,6-dimethylphenylimino)acetate (**6p**):[7] Pale yellow oil, R_f 0.34 (hexane/ethyl acetate: 19/1); t_r 14.89; ν (film) 1736, 1708 (C=O, C=N), 1471 (HC=C), 1260, 1060 cm^{-1} (CO); δ_H 1.16 (3H, t, *J*=7.1, CH_3CH_2), 1.20-2.05 [10H, m, $(CH_2)_5CH$], 2.07 [6H, s, $(CH_3)_2C_6H_3$], 3.50-3.65 (1H, m, $CHCH_2$), 4.17 (2H, q, *J*=7.1, CH_2O), 7.05-7.20 (3H, m, ArH); δ_C 14.15 (CH_3CH_2), 17.65 [$(CH_3)_2C_6H_3$], 25.75, 25.85, 29.7 (5xCH_2), 44.55 ($CHCH_2$), 62.7 (CH_2O), 127.9, 128.2, 135.15, 136.75 (ArC), 153.75 (C=N), 178.05 (C=O); *m/z* 248 (M^+-39, <1%), 220 (20), 194 (16), 193 (100), 165 (33), 147 (35), 121 (17), 120 (19), 83 (55), 55 (52).

Methyl 2-cyclohexyl-2-(2,6-dimethylphenylimino)ethanethioate (**6q**): Pale yellow oil, R_f 0.26 (hexane/ethyl acetate: 19/1); t_r 16.04; ν (film) 3030, 1595 (CH=C), 1215 (CS), 1650 cm^{-1} (C=N); δ_H 1.00-2.20 [14H, m with s at 2.07, $(CH_2)_5CH$, CH_3S], 2.32 [6H, s, $(CH_3)_2C_6H_3$], 6.85-7.00 (3H, m, ArH); δ_C 18.6, 19.6 [$(CH_3)_2C_6H_3$, CH_3S], 25.35, 26.4, 26.55, 29.7, 30.1 (5xCH_2), 42.0 ($CHCH_2$), 125.7, 126.1, 127.8, 144.95 (ArC), 161.95 (C=N), 191.8 (C=O); *m/z* 291 (M^++2, 2%), 290 (M^++1, 6), 289 (M^+, 43), 214 (48), 200 (72), 158 (50), 147 (91), 132 (100), 117 (26), 105 (43), 91 (14), 77 (50), 67 (21), 55 (45).

2-Cyclohexyl-2-(2,6-dimethylphenylimino)-1-phenyl-1-ethanol (**6r**): Pale yellow oil, R_f 0.14 (hexane/ethyl acetate: 9/1); t_r 18.5; ν (film) 3392 (OH), 3063, 3029, 1594, 1450 (HC=C), 1667 cm^{-1} (C=N); δ_H 1.20-1.80 [10H, m, $(CH_2)_5$], 2.10-2.30 [7H, m with s at 2.15, $(CH_3)_2C_6H_3$, $CHCH_2$], 5.35 (1H, br. s, CHO), 6.00 (1H, br. s, OH), 6.90-7.15, 7.25-7.55 (4 and 4H, respectively, 2m, ArH); δ_C 18.2, 18.7 [$(CH_3)_2C_6H_3$], 25.5, 25.95, 26.1, 29.05, 29.4 [$(CH_2)_5$], 42.9 ($CHCH_2$), 73.6 (CO), 123.3, 126.05, 128.05, 128.15, 128.25, 128.6, 141.05, 146.05 (ArC), 176.65 (C=N); *m/z* 321 (M^+, <1%), 215 (17), 214 (100), 132 (55), 117 (10), 105 (28), 79 (14), 77 (34), 55 (35) (Found: M^+, 321.2100. $C_{22}H_{27}NO$ requires 321.2092).

IV.4. Naphthalene catalysed double lithiation of imidoyl chlorides **5** and *reaction with electrophiles. Isolation of compounds* **7**, **8** and **9**

General procedure.- To a green suspension of lithium powder (100 mg, 14 mmol) and naphthalene (10 mg, 0.08 mmol) in THF was slowly added (*ca.* 10 min) a solution of the corresponding imidoyl chloride **5** in THF (2 ml). Stirring was continued for 2 h (in the case of **7e**), for 3 h (in the case of **7g -h**) and 6 h (in the case of **7f**). Then, a solution of the corresponding electrophile (1.2 mmol) in THF (2 ml) was added. The resulting mixture was stirring, allowing the temperature to rise to 20°C for 8 h (in the case of compound **7c**) or 3 h (in the case of compounds **7a**, **7d**, **7i**, **8**, **9a** and **9b**). The resulting mixture was then hydrolysed with water (5 ml) and extracted with ethyl acetate (2x20 ml). The organic layer was dried over anhydrous Na_2SO_4 and the solvents were evaporated (15 Torr) to give a residue, which was purified by column chromatography (silica gel, hexane/ethyl acetate) affording the pure title compounds. Yields are included in Table 2, in Scheme 4 and in the text. Physical, spectroscopic and analytical data follow.

4-(2,6-Dimethylaniline)-2,5,5,5-tetramethyl-3-hexanol (**7a**): Pale yellow oil, R_f 0.51 (hexane/ethyl acetate: 9/1); t_r 14.64; ν (film) 3500, 3441 (OH, NH), 1596, 1511 cm^{-1} (HC=C); δ_H 0.90, 0.92 [9 and 9H, respectively, 2s, 2x$(CH_3)_3C$], 2.25, 2.41 [3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$], 3.53, 3.80, 4.15-4.20 (1, 1 and 2H, respectively, d, d and m, *J*=6.4, 11.0, respectively, CHN, CHO, OH, NH), 6.50-6.60, 6.80-6.95 (1 and 2H, respectively, 2m, ArH); δ_C 18.90, 22.60 [$(CH_3)_2C_6H_3$], 26.55, 27.2 [2x$(CH_3)_3C$], 35.45, 37.75 [2x$C(CH_3)_3$], 58.05 (CHN), 76.85 (CO), 117.2, 121.9, 124.05, 128.6, 131.2, 145.8 (ArC); *m/z* 278 (M^++1, <1%), 277 (M^+, 4), 221 (16), 220 (100), 190 (41), 164 (27), 134 (16), 132 (28), 121 (24), 120 (11), 57 (41) (Found: M^+, 277.2395. $C_{18}H_{31}NO$ requires 277.2406).

2-(2,6-Dimethylanilino)-3,3-dimethyl-1-phenyl-1-butanol (**7b**): Pale yellow oil, R_f 0.40 (hexane/ethyl acetate: 9/1); t_r 16.6; ν (film) 3608, 3434 (OH, NH), 3051, 3028, 1595, 1476 cm^{-1} (HC=C); δ_H 0.99 [9H, s, $(CH_3)_3C$], 2.05-2.15 [6H, s, $(CH_3)_2C_6H_3$], 2.50, 3.90 (1 and 1H, respectively, 2 br. s, NH, OH), 3.55-3.70 (1H, m, CHN), 6.54, 6.77 (1 and 2H, respectively, t and d, respectively, *J*=7.3, ArH), 7.10-7.30 (5H, m, ArH); δ_C 19.7 [$(CH_3)_2C_6H_3$], 27.8 [$(CH_3)_3C$], 37.2 [$C(CH_3)_3$], 66.95 (CN), 72.5 (CO), 118.6, 124.4, 126.0, 127.0, 128.0, 129.5, 144.35, 145.7 (ArC); *m/z* 297 (M^+, <1%), 191 (32), 190 (100), 132 (15), 120 (12), 77 (12) (Found: M^+, 297.2095. $C_{20}H_{27}NO$ requires 297.2092).

1-[1-(2,6-Dimethylanilino)-2,2-dimethylpropyl]-1-cyclohexanol (**7c**): Pale yellow oil, R_f 0.30 (hexane/ethyl acetate: 9/1); t_r 15.55; ν (film) 3435 (NH, OH), 1596, 1477 cm^{-1} (HC=C); δ_H 1.06 [9H, s, $(CH_3)_3C$], 1.55-1.90 (11H, m, 5xCH_2, OH), 2.30, 2.47 [3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$], 3.65-3.70 (1H, m, CHN), 3.85-3.90 (1H, m, NH), 6.62 (1H, t, *J*=7.3, ArH), 6.91, 6.95 (1 and 1H, respectively, 2d, *J*=7.3, ArH); δ_C 19.05 [$(CH_3)_2C_6H_3$], 21.9, 22.4, 25.85, 35.4, 37.25 (5xCH_2), 29.6 [$(CH_3)_3C$], 37.9 [$C(CH_3)_3$], 69.35 (CHN), 75.25 (CO), 117.8, 122.1, 123.05, 128.75, 131.7, 146.3 (ArC); *m/z* 271 (M^+-18, 1%), 214 (23), 191 (15), 190 (100), 135

(13), 132 (64), 121 (19), 120 (29), 117 (14), 106 (14), 105 (17), 91 (10), 79 (20), 77 (20), 69 (13), 57 (12), 55 (35), 43 (14), 42 (26) (Found: M^+-H_2O, 271.2290. $C_{19}H_{29}N$ requires 271.2300).

3-(2,6-Dimethylanilino)-4,4-dimethyl-2-phenyl-2-pentanol (**7d**):[7] Pale yellow oil, R_f 0.17 (hexane/ethyl acetate: 9/1); t_r 17.26; ν (film) 3544, 3435 (OH, NH), 3059, 3025, 1595, 1476 cm^{-1} (HC=C); δ_H 0.70 [9H, s, $(CH_3)_3C$], 1.62 (3H, s, CH_3CO), 2.30, 2.53 (3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$], 2.75-2.80 (1H, m, CHN), 4.05-4.20 (2H, m, OH, NH), 6.60 (1H, t, J=7.4, ArH), 6.90-6.95, 7.20-7.25, 7.30-7.35, 7.45-7.55 (2, 1, 2 and 2H, respectively, 4m, ArH); δ_C 19.1, 22.25 [$(CH_3)_2C_6H_3$], 29.3 [$(CH_3)_3C$], 32.5 (CH_3CO), 38.35 [$C(CH_3)_3$], 68.1 (CHN), 78.45 (CO), 117.6, 121.65, 123.1, 125.3, 126.6, 128.0, 128.3, 128.55, 128.9, 131.65, 146.4, 147.8 (ArC); *m/z* 258 (M^+-53, <1%), 236 (13), 191 (14), 190 (100), 132 (23), 120 (12), 105 (12), 77 (13), 43 (22).

Ethyl 2-(2,6-dimethylanilino)-3,3-dimethylbutanoate (**7e**): Pale yellow oil, R_f 0.26 (hexane/ethyl acetate: 9/1); t_r 11.87; ν (film) 3392 (NH), 3060, 3043, 1646, 1475 (HC=C), 1732 cm^{-1}(C=O); δ_H 1.00-1.10 (3H, m, CH_3CH_2), 1.14 [9H, s, $(CH_3)_3C$], 2.17 (1H, s, OH), 2.32 (7H, s, $(CH_3)_2C_6H_3$, NH), 3.81 (1H, s, CHN), 3.96 (2H, c, J=7.0, CH_2), 6.70-6.80, 6.90-6.95 (1 and 2H, respectively, 2m, ArH); δ_C 14.05 (CH_3CH_2), 18.9 [$(CH_3)_2C_6H_3$], 26.6 [$(CH_3)_3C$], 34.35 [$C(CH_3)_3$], 60.05 (CH_2), 67.4 (CN), 121.35, 128.15, 129.05, 143.95 (ArC), 173.9 (C=O); *m/z* 265 (M^++2, <1%), 264 (M^++1, 3), 263 (M^+, 15), 207 (12), 206 (85), 190 (56), 133 (12), 132 (100), 120 (11), 117 (14), 105 (14), 77 (13) (Found: M^+, 263.1890. $C_{16}H_{25}NO_2$ requires 263.1885).

(-)-Menthyl 2-(2,6-dimethylanilino)-3,3-dimethylbutanoate (**7f**): Pale yellow oil, R_f 0.76 (hexane/ethyl acetate: 9/1); t_r 17.15, 17.36; ν (film) 3392 (NH), 3043, 1595 (HC=C), 1727 cm^{-1} (C=O); δ_H 0.58, 0.60, 0.73, 0.78, 0.84, 0.87 (18H, 6d, 6.7, 7.0, 6.7, 7.0, 6.2, 6.2, respectively, 6xCH_3CH), 0.90-2.15 [34H, m with s at 1.14, 2x$(CH_3)_3$, 6xCH_2, 4xC*H*CH_3], 2.30 [12H, s, 2x$(CH_3)_2C_6H_3$], 3.70-3.90 (4H, m, 2xCHN, 2xNH), 4.40-4.55 (2H, m, 2xCHO), 6.70-6.95 (5H, m, ArH); δ_C 15.5, 15.55, 18.75, 18.9, 20.7, 20.9, 21.8, 22.05, 25.55, 25.60 (10xCH_3), 26.5, 26.55 [2x$(CH_3)_3C$], 33.95, 34.05 [2x$C(CH_3)_3$], 27.9, 28.0, 31.15, 31.4, 46.55, 46.7 (6xCH), 67.55, 67.8 (2xCHN), 73.95, 74.35 (2xCOH), 121.4, 121.7, 128.0, 128.15, 128.5, 128.9, 129.0, 143.85 (ArC), 173.7, 173.85 (2xC=O); *m/z* 375 (M^++2 , <1%), 374 (M^++1, 1), 373 (M^+, 4), 191 (15), 190 (100), 179 (12), 178 (88), 132 (28), 120 (10), 83 (26), 69 (13), 57 (14), 55 (29), 43 (20) (Found: M^+, 373.2976. $C_{24}H_{39}NO_2$ requires 373.2981).

2-Cyclohexyl-2-(2,6-dimethylanilino)-1-phenyl-1-ethanol (**7g**): Pale yellow oil, R_f 0.24 (hexane/ethyl acetate: 9/1); t_r 19.2; ν (film) 3402 (NH, OH), 3061, 3028, 1595, 1474 cm^{-1} (HC=C); δ_H 1.00-1.70 [10H, m, $(CH_2)_5$], 2.10-2.20 [1H, m, C*H*CH_2], 2.35 [6H, s, $(CH_3)_2C_6H_3$], 3.55-3.65 (3H, m, CHN, OH, NH), 4.70 (1H, d, J=7.3, CHO), 6.65-6.75, 6.90-7.0, 7.25-7.50 (1, 2 and 5H, respectively, 3m, ArH); δ_C 19.85 $[(CH_3)_2C_6H_3]$, 26.35, 26.45, 26.5, 28.45, 29.9 $[(\mathrm{CH_2})_5]$, 40.45 (CHCH$_2$), 66.8 (CN), 74.05 (CO), 121.0, 123.4, 126.9, 127.1, 127.8, 128.1, 128.2, 128.25, 128.35, 128.6, 129.7, 142.1 (ArC); *m/z* 322 (M^+-1, <1%), 217 (17), 216 (100), 134 (23), 132 (13), 105 (17), 77 (23) (Found: M^+-H, 322.2180. $C_{22}H_{28}NO$ requires 322.2171).

3-[Cyclohexyl-(2,6-dimethylanilino)]methyl-3-pentanol (**7h**): Pale yellow oil, R_f 0.22 (hexane/ ethyl acetate: 19/1); t_r 16.91; ν (film) 3375 (NH, OH), 1594, 1472 cm^{-1} (HC=C); δ_H 0.99 (6H, t, J=7.6, 2xCH_3CH$_2$), 1.30-1.80 (15H, m, 7xCH$_2$, CHCH$_2$), 2.35 [6H, s, $(CH_3)_2C_6H_3$], 3.19 (2H, br. s, NH, CHN), 4.20 (1H, br. s, OH), 6.86, 7.01 (1 and 2H, respectively, t and d, respectively, J=7.4, ArH); δ_C 9.45 (2xCH$_3$CH$_2$), 18.85 $[(CH_3)_2C_6H_3]$, 21.95, 26.05, 27.35, 28.1 (7xCH$_2$), 43.65 (CHCH$_2$), 49.15 (CHN), 79.4 (CO), 122.85, 129.15, 130.25, 145.5 (ArC); *m/z* 285 (M^+-18, 2%), 135 (14), 134 (100), 133 (15), 132 (15), 81 (14), 79 (10), 67 (12), 55 (12) (Found: M^+-H_2O, 285.2465. $C_{20}H_{31}N$ requires 285.2456).

1-[Cyclohexyl(2,6-dimethylanilino)]methyl-1-cyclohexanol (**7i**): Pale yellow oil, R_f 0.31 (hexane/ethyl acetate: 19/1); t_r 18.78; ν (film) 3384 (NH, OH), 1593, 1472 cm^{-1} (HC=C); δ_H 1.30-1.90 [21H, m, 2x(CH$_2$)$_5$, CHCH$_2$], 2.35 [6H, s, $(CH_3)_2C_6H_3$], 3.16 (2H, s, CHN, NH), 4.15 (1H, br. s, OH), 6.87, 7.00 (1 and 2H, respectively, t and d, J=7.6, ArH); δ_C 18.9 $[(CH_3)_2C_6H_3]$, 21.7, 21.9, 26.1, 26.15, 27.75, 31.43 (10xCH$_2$), 42.25 (CHCH$_2$), 48.5 (CHN), 77.15 (CO), 122.95, 129.15, 130.4, 145.45 (ArC); *m/z* 316 (M^++1, 1%), 315 (M^+, 3), 164 (12), 135 (13), 134 (100), 133 (19), 121 (17), 82 (10), 55 (11) (Found: M^+, 315.2571. $C_{21}H_{33}NO$ requires 315.2562).

*4-(*tert*-Butyl)-4-(2,6-dimethylanilino)-2,2,6,6-tetramethyl-3,3-heptanediol* (**8**): Pale yellow oil, R_f 0.34 (hexane/ ethyl acetate: 9/1); t_r 17.50; ν (film) 3433 (OH, NH), 1593, 1470 cm^{-1} (HC=C); δ_H 0.87, 0.92, 1.02 [9, 9 and 9H, respectively, 3s, 3x(CH$_3$)$_3$C], 2.40 [6H, s, $(CH_3)_2C_6H_3$], 2.71 (1H, br. s, NH), 2.90, 3.42 (2H, 2 br. s, 2xOH), 3.51, 3.75 (2H, 2 br. s, 2xCHO), 6.50-6.70, 6.85-6.95 (1 and 2H, respectively, 2m, ArH); δ_C 22.70 $[(CH_3)_2C_6H_3]$, 25.85, 26.5, 27.4 [3x(CH$_3$)$_3$C], 34.9, 35.6, 37.6 [3xC(CH$_3$)$_3$], 58.5 (CN), 77.2, 79.05 (2xCO), 117.8, 123.75, 126.05, 129.7, 131.8, 146.0 (ArC); *m/z* 345 (M^+-18, <1%), 307 (10), 306 (41), 288 (22), 276 (30), 218 (28), 146 (13), 144 (11), 133 (11), 132 (100), 120 (13), 117 (12), 57 (64), 55 (10), 43 (18) (Found: M^+-H_2O, 345.3035. $C_{22}H_{39}NO$ requires 345.3032).

N-*(2,6-Dimethylphenyl)-3,3-dimethyl-1-phenyl-2-butanimine* (**9a**): Pale yellow oil, R_f 0.31 (hexane/ethyl acetate: 19/1); t_r 15.22; ν (film) 3063, 3028, 1469 (HC=C), 1650 cm^{-1} (C=N); δ_H 1.31 [9H, s, (CH$_3$)$_3$C], 1.89 [6H, s, $(CH_3)_2C_6H_3$], 3.50 (2H, s, CH$_2$), 6.75-7.20 (8H, m, ArH); δ_C 17.85 $[(CH_3)_2C_6H_3]$, 29.05 [(CH$_3$)$_3$C], 36.75 (CH$_2$), 41.4 [C(CH$_3$)$_3$], 122.4, 125.4, 125.8, 127.8, 127.9, 129.3, 136.6, 148.0 (ArC), 176.65 (C=N); *m/z* 280 (M^++1, 3%), 279 (M^+, 12), 222 (21), 189 (10), 188 (65), 133 (11), 132 (100), 91 (66), 79 (13), 77 (19), 65 (11), 57 (25) (Found: M^+, 279.1980. $C_{20}H_{25}N$ requires 279.1987).

N-*(2,6-Dimethylphenyl)-3,3-dimethyl-1,1-diphenyl-2-butanimina* (**9b**): White crystals, R_f 0.53 (hexane/ethyl acetate: 9/1); t_r 19.15; mp 163-164°C (hexane/ethyl acetate); ν (melted) 3030, 1467 (HC=C), 1655 cm^{-1} (C=N); δ_H 1.09 [9H, s, $(CH_3)_3C$], 1.82 [6H, s, $(CH_3)_2C_6H_3$], 5.36 (1H, s, CHPh), 6.71, 6.85 (1 and 2H, respectively, d and t, J=7.3, ArH), 7.10-7.40, 7.50-7.60 (6 and 4H, respectively, 2m, ArH); δ_C 18.9 [$(CH_3)_2C_6H_3$], 28.55 [$(CH_3)_3C$], 44.35 [$C(CH_3)_3$], 56.3 (*C*HPh), 120.95, 123.1, 126.4, 127.45, 127.95, 129.35, 142.5, 148.9 (ArC), 173.8 (C=N); *m/z* 355 (M$^+$, 1%), 189 (13), 188 (82), 167 (22), 165 (13), 133 (10), 132 (100), 105 (12), 57 (25) (Found: M$^+$, 355.2294. $C_{26}H_{29}N$ requires 355.2300).

IV.5. Hydrolysis of imines **6c**, **6e**, **6g**, **6h-k**, **6m** and **9a**. *Preparation of ketones* **10**.

General procedure.- A solution of the corresponding hydroxyimine **6** or **9** (1 mmol) and 2N HCl (5 ml) in THF (5 ml) was stirring at room temperature for 12 h. Water (5 ml) was added and the resulting mixture was extracted with ethyl acetate (2x20 ml). The organic layer was dried over anhydrous Na_2SO_4 and the solvents were evaporated (15 Torr) affording the pure title compounds (2x20 ml). Yields are included in Table 3. Physical, spectroscopic and analytical data, as well as literature references for known compounds, follow.

3,3-Dimethyl-1-hydroxy-1-phenyl-2-butanone (**10a**) [33]: Pale yellow oil, R_f 0.28 (hexane/ethyl acetate: 19/1); t_r 9.62; ν (film) 3457 (OH), 3064, 3031, 1597 (HC=C), 1701 cm^{-1} (C=O); δ_H 1.05 [9H, s, $(CH_3)_3C$], 4.30, (1H, br. s, OH), 5.40 (1H, s, CHO), 7.20-7.35 (5H, m, ArH); δ_C 27.2 [$(CH_3)_3C$], 43.1 [$C(CH_3)_3$], 75.7 (CO), 128.05, 128.6, 128.9, 138.4 (ArC), 215.25 (C=O); *m/z* 164 (M$^+$-28, 3%), 108 (12), 107 (100), 79 (31), 77 (34), 57 (62), 51 (14).

1-(1-Hydroxycyclohexyl)-2,2-dimethyl-1-propanone (**10b**) [34]: Pale yellow oil, R_f 0.37 (hexane/ethyl acetate: 19/1); t_r 8.55; ν (film) 3439 (OH), 1651 cm^{-1} (C=O); δ_H 1.28 [9H, s, $(CH_3)_3C$], 1.50-2.00 (11H, m, 5xCH_2, OH); δ_C 21.1, 25.05, 35.2 (5xCH_2), 27.4 [$(CH_3)_3C$], 44.7 [$C(CH_3)_3$], 80.9 (CO), 218.65 (C=O); *m/z* 123 (M$^+$-61, 1%), 99 (100), 98 (10), 81 (96), 79 (12), 57 (25), 55 (29), 43 (32), 42 (13).

2,2-Dimethyl-3,4-undecanedione (**10c**):[7] Pale yellow oil, R_f 0.44 (hexane/ethyl acetate: 9/1); t_r 8.90; ν (film) 1702 cm^{-1} (C=O); δ_H 0.85-0.90 (3H, m, CH_3CH_2), 1.00-1.60 [19H, $(CH_2)_5CH_3$, $(CH_3)_3C$], 2.60-2.70 (2H, m, CH_2CO); δ_C 14.05 (CH_3CH_2), 22.55, 22.7, 28.95, 29.0, 31.6, 38.75 (6xCH_2), 26.05 [$(CH_3)_3C$], 42.0 [$C(CH_3)_3$], 203.4, 208.05 (2xCO); *m/z* 128 (M$^+$-84, 1%), 127 (11), 57 (100), 43 (22).

4-Hydroxy-2,2,5-trimethyl-3-hexanone (**10d**):[7] Pale yellow oil, R_f 0.32 (hexane/ethyl acetate: 19/1); t_r 5.65; ν (film) 3363 (OH), 1668 cm^{-1}(C=O); δ_H 0.70, 1.11 [3 and 3H, respectively, 2d, J=6.7, $(CH_3)_2CH$], 1.21 [9H, s, $(CH_3)_3C$], 2.00-2.20 [1H, m, $CH(CH_3)_2$], 3.17 (1H, d, J=7.3, OH), 4.35-4.45 (1H, m, CHO); δ_C 14.35 [$(CH_3)_2CH$], 26.95 [$(CH_3)_3C$], 30.85 [$CH(CH_3)_2$], 42.7

[*C*(CH$_3$)$_3$], 77.2 (CO), 217.6 (C=O); *m/z* 130 (M$^+$-28, 1%), 88 (11), 86 (67), 84 (91), 58 (23), 51 (68), 49 (100), 48 (21), 47 (40), 43 (77), 42 (19).

4-Hydroxy-2,2,5,5-tetramethyl-3-hexanone (**10e**) [34]: Pale yellow oil, R_f 0.35 (hexane/ethyl acetate: 19/1); t_r 4.50; ν (film) 3416 (OH), 1650 cm^{-1} (C=O); δ_H 0.98, 1.19 [9 and 9H, respectively, 2s, 2x(CH$_3$)$_3$C], 3.35-3.60 (1H, m, CHO), 4.20 (1H, s, OH); δ_C 26.05, 26.55 [2x(*C*H$_3$)$_3$C], 36.5, 38.5 [2x*C*(CH$_3$)$_3$], 76.0 (CO), 219.05 (C=O); *m/z* 172 (M$^+$, 1%), 116 (28), 101 (38), 88 (12), 87 (100), 69 (69), 57 (75), 55 (12), 45 (60), 43 (36).

4-Hydroxy-2,2-dimethyl-3-nonanone (**10f**): Pale yellow oil, R_f 0.38 (hexane/ethyl acetate: 19/1); t_r 8.54; ν (film) 3474 (OH), 1698 cm^{-1} (C=O); δ_H 0.89 (3H, t, *J*=6.7, C*H*$_3$CH$_2$), 1.15-1.75 [17H, m with s at 1.21, (CH$_3$)$_3$C, 4xCH$_2$], 3.20 (1H, d, *J*=7.9, OH), 4.45-4.55 (1H, m, CHO); δ_C 14.0 (*C*H$_3$CH$_2$), 22.5, 24.85, 31.55, 34.9 (4xCH$_2$), 26.8 [(*C*H$_3$)$_3$C], 42.65 [*C*(CH$_3$)$_3$], 72.5 (CO), 218.0 (C=O); *m/z* 186 (M$^+$, 1%), 101 (53), 100 (38), 87 (21), 85 (10), 84 (14), 83 (100), 82 (14), 58 (12), 57 (86), 56 (28), 55 (91), 45 (15), 44 (20), 43 (57), 42 (13).

2{2-[2-(2,2-dimethylpropanoylcarbonyloxy)ethoxy]ethoxy}ethyl 3,3-dimethyl-2-oxobutanoate (**10g**):[7] Pale yellow oil, R_f 0.7 (hexane/ethyl acetate: 1/1); t_r 24.52; ν (film) 1739 (C=O), 1054 cm^{-1} (CO); δ_H 1.25 [18H, s, 2x(CH$_3$)$_3$C], 3.60-3.65, 3.70-3.80, 4.35-4.45 (4, 4 and 4H, respectively, 3m, 6xCH$_2$); δ_C 25.65 [2x(*C*H$_3$)$_3$C], 43.0 [2x*C*(CH$_3$)$_3$], 64.3, 68.7, 70.6 (6xCH$_2$), 163.7 (2xOCO), 201.75 (2xOCO*C*O); *m/z* 245 (M$^+$-129, 1%), 157 (22), 85 (38), 73 (11), 58 (10), 57 (100), 42 (12).

3,3-Dimethyl-1-phenyl-2-butanone (**10h**) [35]: Pale yellow oil, R_f 0.55 (hexane/ethyl acetate: 2/1); t_r 9.69; ν (film) 3030, 1595 (HC=C), 1710 cm^{-1} (C=O); δ_H 1.20 [9H, s, (CH$_3$)$_3$C], 3.81 (2H, s, CH$_2$), 7.10-7.35 (5H, m, ArH); δ_C 26.4 [(*C*H$_3$)$_3$C], 43.25 (CH$_2$), 44.65 [(CH$_3$)$_3$*C*], 126.6, 128.35, 129.5, 134.9 (ArC), 212.85 (C=O); *m/z* 176 (M$^+$, 10%), 91 (98), 85 (100).

IV.6. Reduction of hydroxyimines **6**. *Isolation of aminoalcohols* **7**

General Procedure.- A solution of the corresponding starting material **6** (1 mmol) and LiAlH$_4$ (1.19 g, 30 mmol) in THF (10 ml) was stirred at room temperature for 12 h. The resulting mixture was hydrolysed with water (5 ml) and filtered through a plug of celite. The filtrated was extracted with ethyl acetate (2x20 ml). The organic layer was dried over anhydrous Na$_2$SO$_4$ and the solvents were evaporated (15 Torr) to give a residue, which was purified by column chromatography (silica gel, hexane/ethyl acetate) affording the pure title compounds. Yields are included in Table 4. Physical, spectroscopic and analytical data follow.

2,5,5-Trimethyl-4-(1-octylamino)-3-hexanol (**7j**): Pale yellow oil, R_f 0.47 (hexane/ethyl acetate: 9/1); t_r 14.09; ν (film) 3462 cm^{-1} (OH, NH); δ_H 0.85-0.90 (6H, m, C*H*$_3$CH$_2$, C*H*$_3$CH), 0.96 (3H, d, *J*=6.7, C*H*$_3$CH), 1.01 [9H, s, (CH$_3$)$_3$C], 1.20-1.50 [13H, m, (C*H*$_2$)$_6$CH$_3$, NH], 1.95-

2.10 (1H, m, C*H*CH$_3$), 2.29 (1H, d, *J*=5.5, OH), 2.45-2.65, 2.70-2.85 (1 and 2H, respectively, 2m, CH$_2$N, CHN), 3.35-3.40 (1H, m, CHO); δ_C 14.05 (*C*H$_3$CH$_2$), 17.2, 21.2 [(*C*H$_3$)$_2$CH], 22.6, 27.3, 29.25, 29.55, 31.2, 31.85 [(*C*H$_2$)$_6$CH$_3$], 28.3 [(*C*H$_3$)$_3$C], 29.9 [*C*H(CH$_3$)$_2$], 35.45 [*C*(CH$_3$)$_3$], 51.7 (CH$_2$N), 69.6 (CHN), 76.85 (CHO); *m/z* 256 (M$^+$-15, <1%), 214 (27), 199 (14), 198 (100), 86 (13), 84 (15), 72 (11), 71 (13), 69 (13), 57 (36), 55 (23), 44 (14), 43 (57), 42 (15) (Found: M$^+$-CH$_3$, 256.2635. C$_{16}$H$_{34}$NO requires 256.2640).

2,2,5,5-Tetramethyl-4-(1-octylamino)-3-hexanol (**7k**): Pale yellow oil, R_f 0.40 (hexane/ethyl acetate: 9/1); t_r 14.55; ν (film) 3476 cm^{-1} (OH); δ_H 0.85-0.90 (3H, m, C*H*$_3$CH$_2$), 0.99, 1.01 [9 and 9H, respectively, 2s, 2x(CH$_3$)$_3$C], 1.20-1.45 (14H, m, (C*H*$_2$)$_6$CH$_3$, NH, OH], 2.15 (1H, d, *J*=6.4, CHN), 2.55-2.70 (2H, m, CH$_2$N), 3.19 (1H, d, *J*=6.4, CHO); δ_C 14.05 (*C*H$_3$CH$_2$), 22.6, 27.4, 29.25, 30.95, 31.85 [(*C*H$_2$)$_6$CH$_3$], 26.85, 28.1 [2x(*C*H$_3$)$_3$C], 36.0, 37.0 [2x*C*(CH$_3$)$_3$], 51.5 (CH$_2$N), 69.25 (CHN), 83.05 (CO); *m/z* 286 (M$^+$+1, <1%), 228 (60), 199 (15), 198 (100), 172 (15), 86 (13), 84 (12), 72 (16), 71 (14), 69 (16), 60 (20), 57 (57), 55 (15), 44 (15), 43 (49), 42 (13) (Found: M$^+$+H, 286.3114. C$_{18}$H$_{40}$NO requires 286.3110).

2,2-Dimethyl-3-(1-octylamino)-4-nonanol (**7l**): Pale yellow oil, R_f 0.33 (hexane/ethyl acetate: 9/1); t_r 15.67; ν (film) 3441 cm^{-1} (OH, NH); δ_H 0.85-0.90 (6H, m, 2xC*H*$_3$CH$_2$), 0.98 [9H, s, (CH$_3$)$_3$C], 1.15-1.50 [22H, m, 10xC*H*$_2$CH$_2$, OH, NH], 2.37 (1H, d, *J*=4.0, CHN), 2.55-2.65, 2.80-2.90 (1 and 1H, respectively, 2m, CH$_2$N), 3.60-3.65 (1H, m, CHO); δ_C 14.05 (2x*C*H$_3$CH$_2$), 22.6, 22.7, 26.3, 27.2, 29.25, 29.5, 31.4, 31.8, 32.0, 32.85 (10xCH$_2$), 28.3 [(*C*H$_3$)$_3$C], 34.95 [*C*(CH$_3$)$_3$], 51.95 (CH$_2$N), 71.6, 71.85 (CHN, CHO); *m/z* 281 (M$^+$-18, 5%), 210 (30), 208 (13), 207 (61), 182 (15), 168 (15), 141 (11), 140 (96), 126 (25), 112 (23), 98 (20), 96 (14), 84 (24), 82 (13), 73 (16), 71 (21), 70 (44), 69 (23), 68 (10), 58 (15), 57 (77), 56 (62), 55 (93), 54 (12), 53 (11), 44 (43), 43 (100), 42 (72) (Found: M$^+$-H$_2$O, 281.3085. C$_{19}$H$_{39}$N requires 281.3083).

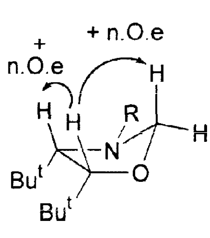
3,3-Dimethyl-2-(1-octylamino)-1-phenylbutanol (**7m**):[7] Pale yellow oil, R_f 0.33 (hexane/ethyl acetate: 9/1); t_r 16.37; ν (film) 3350 (OH, NH), 3063, 3029, 1466 (HC=C), 1241 cm^{-1} (CO); δ_H 0.77 [9H, s, (CH$_3$)$_3$C], 0.85-0.90 (3H, m, C*H*$_3$CH$_2$), 1.15-1.55 [14H, m, (C*H*$_2$)$_6$CH$_3$, OH, NH], 2.60-2.65 [2H, m with d at 2.61, *J*=4.7, C*H*HN, CHN], 2.80-2.90 (1H, m, CH*H*N), 4.68 (1H, d, *J*=4.7, CHO), 7.15-7.40 (5H, m, ArH); δ_C 14.05 (*C*H$_3$CH$_2$), 22.6, 27.2, 29.2, 29.5, 31.2, 31.8 [(*C*H$_2$)$_6$CH$_3$], 27.8 [(*C*H$_3$)$_3$C], 35.4 [*C*(CH$_3$)$_3$], 51.95 (CH$_2$N), 72.35 (CHN), 73.35 (CO), 127.1, 127.35, 127.9, 143.4 (ArC); *m/z* 261 (M$^+$-44, 19%), 260 (100), 196 (17), 162 (29), 154 (42), 132(16), 118 (13), 98 (12), 91 (32), 69 (14), 57 (32), 56 (11), 55 (23), 44 (21), 43 (54), 42 (54).

1-Cyclohexyl-1-(2,6-dimethylanilino)-3,3-dimethyl-2-butanol (**7n**):[7] Pale yellow oil, R_f 0.48 (hexane/ethyl acetate: 9/1); t_r 16.46; ν (film) 3405 (NH, OH), 1621, 1594, 1474 cm^{-1} (HC=C); δ_H 0.85 [9H, s, (CH$_3$)$_3$C], 1.20-1.90 [10H, m, (CH$_2$)$_5$], 2.10-2.15 (1H, m, C*H*CH$_2$), 2.25-2.30, 3.10-3.30, 3.37, 3.65-3.75 [7, 1, 1 and 1H, respectively, m, m, s, m, respectively, (C*H*$_3$)$_2$C$_6$H$_3$, CHN, OH, NH, CHO], 6.72, 6.93 (1 and 2H, respectively, t and d, respectively, *J*=7.3, ArH); δ_C 19.15 [$(CH_3)_2C_6H_3$], 26.75 [$(CH_3)_3C$], 26.5, 26.8, 27.4, 28.1, 32.85 [$(CH_2)_5$], 34.95 [$C(CH_3)_3$], 39.4 ($CHCH_2$), 60.45 (CN), 81.65 (CO), 120.45, 128.15, 129.0, 129.3, 135.45, 144.75 (ArC); *m/z* 231 (M^+-72, 1%), 217 (14), 216 (100), 134 (26), 132 (30), 122 (11), 121 (49), 105 (10), 91 (13), 83 (25), 79 (16), 77 (22), 67 (13), 57 (30), 55 (54), 53 (10), 43 (16), 42 (15).

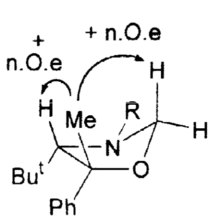
IV.7. Cyclisation of 1,2-aminoalcohols **7**. *Isolation of oxazolidines* **11**

General Procedure [36].- A solution of the corresponding hydroxyimine (1 mmol), paraformaldehyde (0.39 g, 10 mmol) and *p*-toluensulfonic acid (0.019 g, 0.1 mmol) in toluene (20 ml) was refluxed with a Dean-Stark apparatus for 12 h. Water (10 ml) was added and the resulting mixture was extracted with ethyl acetate (2x20 ml). The organic layer was dried over anhydrous Na_2SO_4 and the solvents were evaporated (15 Torr) affording the pure title compounds (2x20 ml). Yields are included in Table 5. Physical, spectroscopic and analytical data follow.

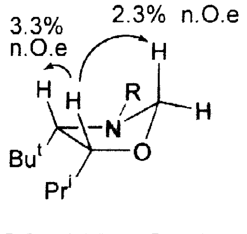
*4,5-Di(*tert*-butyl)-3-(2,6-dimethylphenyl)-1,3-oxazolidine* (**11a**): Pale yellow oil, R_f 0.65 (hexane/ethyl acetate: 9/1); t_r 14.54; ν (film) 1601, 1478 (HC=C), 1090 cm^{-1} (CO); δ_H 0.72, 0.98 [9 and 9H, respectively, 2s, 2x$(CH_3)_3C$], 2.28 [6H, s, $(CH_3)_2C_6H_3$], 3.71, 3.76 (1 and 1H, respectively, 2d, *J*=3.3, CHO, CHN), 4.48, 4.89 (1 and 1H, respectively, 2s, CH_2), 6.65-7.20 (3H, m, ArH); δ_C 18.95, 22.5 [$(CH_3)_2C_6H_3$], 27.45, 28.0 [2x$(CH_3)_3C$], 36.05, 36.6 [2x$C(CH_3)_3$], 65.1 (CHN), 84.2 (CHO), 88.75 (CH_2O), 127.5, 128.25, 129.2, 136.85, 139.9, 146.35 (ArC); *m/z* 289 (M^+, <1%), 233 (19), 232 (100), 132 (18), 57 (15), 43 (14) (Found: M^+, 289.2399. $C_{19}H_{31}NO$ requires 289.2405).



*4-(*tert*-Butyl)-3-(2,6-dimethylphenyl)-5-methyl-5-phenyl-1,3-oxazolidine* (**11b**):[7] Pale yellow oil, R_f 0.51 (hexane/ethyl acetate: 19/1); t_r 17.26; ν (film) 3060, 3025, 1595, 1470 cm^{-1} (HC=C); δ_H 1.00 [9H, s, $(CH_3)_3C$], 2.17 (3H, s, CH_3CO), 2.29 [6H, s, $(CH_3)_2C_6H_3$], 3.65 (1H, s, CHN), 5.20, 5.30 (1 and 1H, respectively, 2s, CH_2), 7.05-7.10, (3H, m, ArH), 7.30-7.55 (5H, m, Ph); δ_C 14.1 [$(CH_3)_2C_6H_3$], 19.8 (CH_3CO), 29.7 [$(CH_3)_3C$], 36.9 [$C(CH_3)_3$], 60.05 (CHN), 67.1 (CH_3CO), 75.0 (CH_2O), 117.75, 126.65, 126.75, 126.9, 128.05, 130.0, 144.2, 145.0 (ArC); *m/z* 310 (M^+-15, 54%), 295 (29), 251 (19), 250 (100), 234 (14), 147 (18), 146 (14), 134 (18), 131 (11), 117 (12), 105 (23), 103 (12), 91 (25), 77 (20), 57 (18), 44 (50), 43 (19), 42 (15).

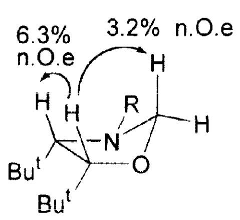


*4-(*tert*-Butyl)-5-isopropyl-3-octyl-1,3-oxazolidine* (**11c**): Pale yellow oil, R_f 0.33 (hexane/ethyl acetate: 9/1); t_r 14.09; ν (film) 1107 cm^{-1} (CO); δ_H 0.85-0.90 (3H, m, CH_3CH_2), 0.95-1.00

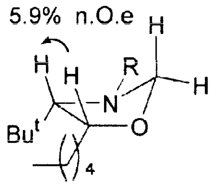


[12H, m, $(CH_3)_3C$, 1x$C\mathit{H}_3CH$], 1.05 (3H, d, *J*=6.4, 1x$C\mathit{H}_3CH$), 1.15-1.50 [12H, m, $(C\mathit{H}_2)_6CH_3$], 2.15-2.30 (1H, m, $CH_2C\mathit{H}N$), 2.38 (1H, d, *J*=4.9, CHN), 2.55-2.75 (1H, m, $CH_2C\mathit{H}N$), 3.13 (1H, dd, *J*=10.9, 4.9, CHO), 3.95, 4.56 (1 and 1H, respectively, 2d, *J*=3.0, CH_2O); δ_C 14.0 ($\mathit{C}H_3CH_2$), 21.05 [$(\mathit{C}H_3)_2CH$], 21.1, 27.2, 27.55, 29.2, 29.5, 31.8 [$(\mathit{C}H_2)_6CH_3$], 27.6 [$\mathit{C}H(CH_3)_2$], 28.1 [$(\mathit{C}H_3)_3C$], 36.45 [$\mathit{C}(CH_3)_3$], 57.85 (CH_2N), 72.6 (CHN), 86.05 (CHO), 86.95 (CH_2O); *m/z* 282 (M^+-1, <1%), 227 (15), 226 (100), 128 (52), 69 (13), 57 (24), 55 (24), 44 (18), 43 (49), 42 (44) (Found: M^+-H, 282.2805. $C_{18}H_{36}NO$ requires 282.2796).

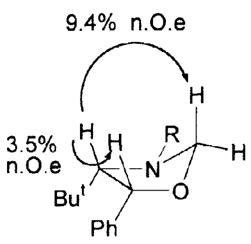
*4,5-Di(*tert*-butyl)-3-octyl-1,3-oxazolidine* (**11d**): Pale yellow oil, R_f 0.20 (hexane/ethyl acetate: 19/1); t_r 14.72; ν (film) 1070 cm^{-1} (CO); δ_H 0.85-0.90 (3H, m, $C\mathit{H}_3CH_2$), 0.99, 1.10 [9 and 9H, respectively, 2s, 2x$(CH_3)_3C$], 1.15-1.45 [12H, m, $(C\mathit{H}_2)_6CH_3$], 2.34 (1H, d, *J*=4.9, CHN), 2.60-2.70 (2H, m, $CH_2C\mathit{H}_2N$), 3.17 (1H, d, *J*=4.9, CHO), 3.96, 4.65 (1 and 1H, respectively, 2d, *J*=3.3, CH_2O); δ_C 14.1 ($\mathit{C}H_3CH_2$), 22.65, 27.3, 29.3, 29.6, 29.7, 31.85 [$(\mathit{C}H_2)_6CH_3$], 28.4, 28.5 [2x$(\mathit{C}H_3)_3C$], 32.45, 36.05 [2x$\mathit{C}(CH_3)_3$], 58.6 (CH_2N), 75.3 (CHN), 86.65 (CH_2O), 88.35 (CHO); *m/z* 296 (M^+-1, <1%), 241 (60), 240 (100), 154 (19), 142 (43), 84 (13), 69 (16), 57 (46), 56 (10), 55 (29), 44 (21), 43 (57), 42 (60) (Found: M^+-H, 296.2949. $C_{19}H_{38}NO$ requires 296.2953).



*4-(*tert*-Butyl)-3-octyl-5-pentyl-1,3-oxazolidine* (**11e**): Pale yellow oil, R_f 0.43 (hexane/ethyl acetate: 19/1); t_r 16.09; ν (film) 1090 cm^{-1} (CO); δ_H 0.85-0.90 (6H, m, 2x$C\mathit{H}_3CH_2$), 0.95 [9H, s, $(CH_3)_3C$], 1.10-1.85 [20H, m, 10x$C\mathit{H}_2CH_2$], 2.34 (1H, d, *J*=5.8, CHN), 2.50-2.55 (2H, m, $CH_2C\mathit{H}_2N$), 3.60-3.70 (1H, m, CHO), 4.01, 4.57 (1 and 1H, respectively, 2d, *J*=3.4, CH_2O); δ_C 14.0, 14.05 (2x$\mathit{C}H_3CH_2$), 22.65, 27.25, 28.05, 29.3, 29.55, 29.7, 31.15, 31.85, 32.0 (10xCH_2), 27.8 [$(\mathit{C}H_3)_3C$], 35.8 [$\mathit{C}(CH_3)_3$], 58.05 (CH_2CH_2N), 74.45 (CHN), 80.15 (CHO), 86.8 (CH_2O); *m/z* 310 (M^+-1, <1%), 255 (18), 254 (100), 156 (44), 154 (10), 69 (13), 57 (27), 56 (12), 55 (28), 44 (22), 43 (54), 42 (38) (Found: M^+-H, 310.3115. $C_{20}H_{40}NO$ requires 310.3109).

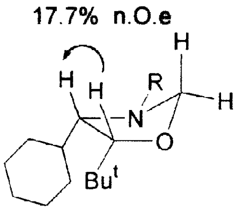


*4-(*tert*-Butyl)-3-octyl-5-phenyl-1,3-oxazolidine* (**11f**):[7] Pale yellow oil, R_f 0.31 (hexane/ethyl acetate: 19/1); t_r 17.66; ν (film) 3064, 3028, 1606, 1454 cm^{-1} (HC=C); δ_H (C_6D_6): 0.80 [9H, s, $(CH_3)_3C$], 0.85-0.95 (3H, m, $C\mathit{H}_3CH_2$), 1.15-1.45 [12H, m, $(C\mathit{H}_2)_6CH_3$], 2.45-2.65 [3H, m with d at 2.55, *J*=6.1, $CH_2C\mathit{H}_2N$, CHN], 4.12, 4.94 (1 and 1H, respectively, 2d, *J*=3.7, CH_2O), 4.3 (1H, d, *J*=4.7, CHO), 7.00-7.25, 7.40-7.55 (3 and 2H, respectively, 2m, ArH); δ_C (C_6D_6) 14.1 ($\mathit{C}H_3CH_2$), 22.65, 27.25, 29.3, 29.6, 29.75, 31.85 [$(\mathit{C}H_2)_6CH_3$], 27.8 [$(\mathit{C}H_3)_3C$], 36.35 [$\mathit{C}(CH_3)_3$], 58.45 (CH_2CH_2N), 76.1 (CHN), 80.0 (CHO), 87.6 (CH_2O), 126.85, 127.1, 127.35, 127.75, 128.4, 138.75 (ArC); *m/z* 260 (M^+-57, 100%), 196 (18), 162

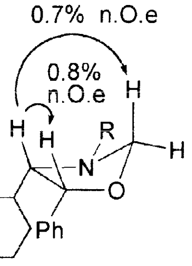


(29), 154 (43), 132(16), 118 (13), 98 (12), 91 (34), 84 (10), 77 (11), 69 (15), 57 (37), 56 (12), 55 (24), 44 (22), 43 (59), 42 (58).

*5-(*tert*-Butyl)-4-cyclohexyl-3-(2,6-dimethylphenyl)-1,3-oxazolidine* (**11g**): Pale yellow oil, R_f 0.50 (hexane/ethyl acetate: 19/1); t_r 14.0; ν (film) 1469 cm^{-1} (HC=C); δ_H 1.10 [9H, s, $(CH_3)_3C$], 1.15-1.70 [10H, m, $(CH_2)_5$], 2.31, 2.40 (3 and 3H, respectively, 2s, $(CH_3)_2C_6H_3$), 2.86 (1H, d, J=11.9, CHN), 3.51 (1H, dd, J=11.9, 1.5, CHO), 4,54, 4.55 (1 and 1H, respectively, d and dd, respectively, J=7.6 and 7.6, 1.5, respectively, CH_2), 6.85-7.05 (3H, m, ArH); δ_C 19.0, 20.3 [$(CH_3)_2C_6H_3$], 20.9, 21.45, 26.6, 27.95, 33.5 [$(CH_2)_5$], 29.7 [$(CH_3)_3C$], 37.3 [$C(CH_3)$], 40.75 ($CHCH_2$), 56.85 (CHN), 83.0 (CHO), 92.5 (CH_2O), 125.35, 128.7, 129.25, 137.3, 138.2, 145.1 (ArC); m/z 316 (M^++1, 1%), 315 (M^+, 4), 148 (10), 137 (12), 134 (18), 133 (100), 132 (32), 109 (14), 81 (10), 69 (12), 67 (12), 57 (10), 55 (15), 43 (10) (Found: M^+, 315.2560. $C_{21}H_{33}NO$ requires 315.2562).



4-Cyclohexyl-3-(2,6-dimethylphenyl)-5-phenyl-1,3-oxazolidine (**11h**): Pale yellow oil, R_f 0.13 (hexane/ethyl acetate: 9/1); t_r 18.89; ν (film) 3035, 3020, 1604 cm^{-1} (HC=C); δ_H 0.90-1.80 [10H, m, $(CH_2)_5$], 1.95-2.30 [7H, m with s at 2.1, $CHCH_2$, $(CH_3)_2C_6H_3$], 3.58 (1H, dd, J=7.3, 3.3, CHN), 4.73, 4.99 (1 and 1H, respectively, 2d, J=2.7, CH_2O), 5.03 (1H, d, J=7.3, CHO), 6.95-7.05, 7.20-7.55 (3 and 5H, respectively, 2m, ArH); δ_C 19.75 [$(CH_3)_2C_6H_3$], 26.6, 26.65, 26.7, 29.5, 29.75 [$(CH_2)_5$], 41.0 ($CHCH_2$), 72.1 (CHN), 82.4 (CHO), 85.35 (CH_2O), 120.1, 125.75, 126.55, 127.1, 127.6, 127.9, 128.45, 128.5, 133.5, 137.0, 140.4, 144.1 (ArC); m/z 335 (M^+, <1%), 253 (17), 252 (88), 229 (32), 222 (24), 147 (12), 146 (100), 132 (18), 117 (12), 105 (21), 91 (49), 79 (14), 77 (26), 55 (17), 44 (16) (Found: M^+, 335.2249. $C_{23}H_{29}NO$ requires 335.2249).



V. Acknowledgment

This work was financially supported by the DGICYT (Project PB94-1514) from the Spanish Ministerio de Educación y Cultura (MEC). DJR thanks MEC for a fellowship.

VI. References

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