Electro-Oxidative Coupling of Furans and Silyl Enoethers: Application to the Synthesis of Annulated Furans

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General Experimental

No special precautions were made to exclude atmosphere from electrolysis reactions. All other non-hydrolytic reactions were performed under an atmosphere of argon and in flame-dried glassware. THF and diethyl ether were distilled from sodium and/or potassium benzophenone. All other materials were obtained from commercial sources. These materials were purified by standard procedures if necessary. When mixtures of $\text{TMSCl}:\text{Et}_3\text{N}$ (1:1) are used, this refers to the supernatant fluid removed from a centrifuged mixture.

Schematic of Electrode

4,5,5a,6,7,8a-Hexahydro-1-oxa-
as-indacen-8-one

4,5,5a,6,7,8a-Hexahydro-1-oxa- α S-indacen-8-one

13C OBSERVE

5a-Methyl-4,5,5a,6,7,8a-hexahydro-1-oxa- α s-indacen-8-one

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5a-Methyl-4,5,5a,6,7,8a-hexahydro-1-oxa- α -indacen-8-one

8a-Methyl-4,5,5a,6,7,8a-hexahydro-1-o
xa- α -indacen-8-one

CW5-269f14-22C
Pulse Sequence: s2nu1

4,5a,6,7,8,9a-Hexahydro-5H-naphtho[1,2-b]furan-9-one

ERS
4,5a,6,7,8,9a-Hexahydro-5H-naphtho[1,2-b]furan-9-one¹

059
Pu11

5a-Methyl-4,5a,6,7,8,9a-hexahydro-5H-naphtho[1,2-*b*]furan-9-one

5a-Methyl-4,5a,6,7,8,9a-hexahydro-5H-naphtho[1,2-b]furan-9-one

9a-Methyl-4,5a,6,7,8,9a-hexahydro-5H-naphtho[1,2-b]furan-9-one

9a-Methyl-4,5a,6,7,8,9a-hexahydro-5H-naphtho[1,2-b]furan-9-one

Octahydro-1-oxa
inden-10-one

10
9
8
7
6
5
4
3
2
1
ppm

1.00
0.94
3.73
0.96
5.36
2.98

4,5,5a,6,7,8,9,10a-Octahydro-1-oxa-cyclohepta[linden]-10-one

1-(4,5,6,7-Tetrahydro-benzofuran-7-yl)-ethanone

STANDARD PROTON PARAMETERS

1-(4,5,6,7-Tetrahydro-benzofuran-7-yl)-ethanone

STANDARD CARBON PARAMETERS

7-Isopropenyl-9a-methyl-4,5a,6,7,8,9a-hexahydro-5H-naphtho[1,2-b]furan-9-one

7-Isopropenyl-9a-methyl-4,5a,6,7,8,9a-hexahydro-5H-naphtho[1,2-b]furan-9-one

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STANDARD CARBON PARAMETERS

5a-Methyl-9-oxo-4,5,5a,6,7,8,9,9a-octahydro-naphthol[1,2-b]furan-6-carboxylic acid ethyl ester

STANDARD CARBON PARAMETERS

4,5,5a,11a-Tetrahydro-1,6-dioxa-cyclopenta[α]anthracen-11-one

4,5,5a,11a-Tetrahydro-1,6-dioxa-cyclopenta[α]anthracen-11-one

chromone

9-Oxo-5,5a,7,8,9,9a-hexahydro-4H-furo[2,3-f]quinoline-6-carboxylic acid methyl ester

STANDARD PROTON PARAMETERS

9-Oxo-5,5a,7,8,9,9a-hexahydro-4H-furo[2,3-f]quinoline-6-carboxylic acid methyl ester

4,5,5a,6,6a,7,7a,8a-Octahydro-1-oxa-cyclopenta
[a]cyclopropa[g]naphthalen-8-one

4,5,5a,6,6a,7,7a,8a-Octahydro-1-oxa-cyclopenta
[a]cyclopropa[g]naphthalen-8-one

13C OBSERVE

Cyclopropyl-(4,5,6,7-tetrahydro-benzofuran-7-yl)-methanone

Cyclopropyl-(4,5,6,7-tetrahydro-benzofuran-7-yl)-methanone

STANDARD CARBON PARAMETERS