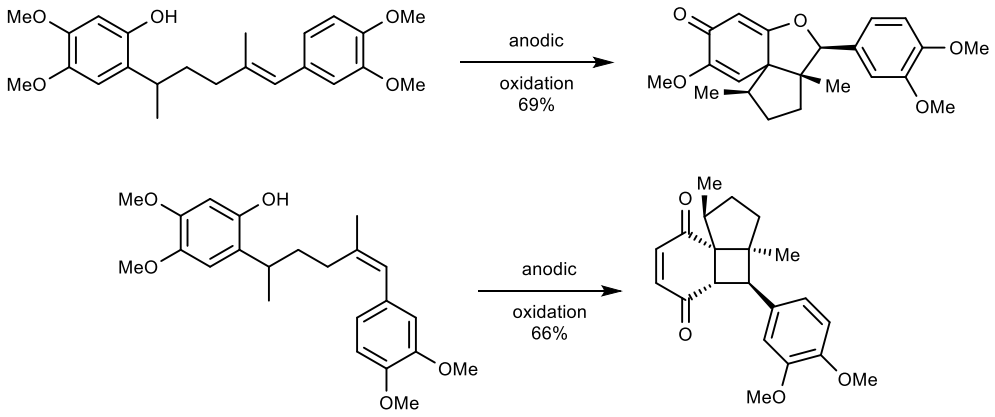
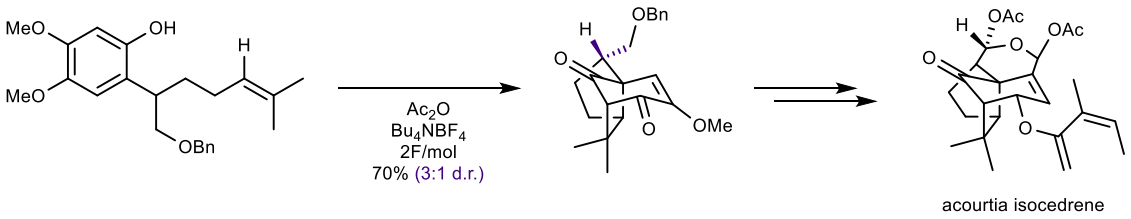
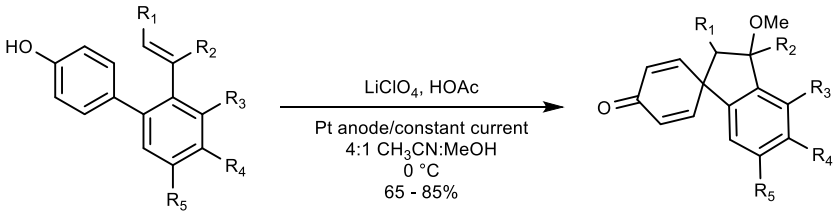
Anodic Olefin Cyclizations

Early examples:



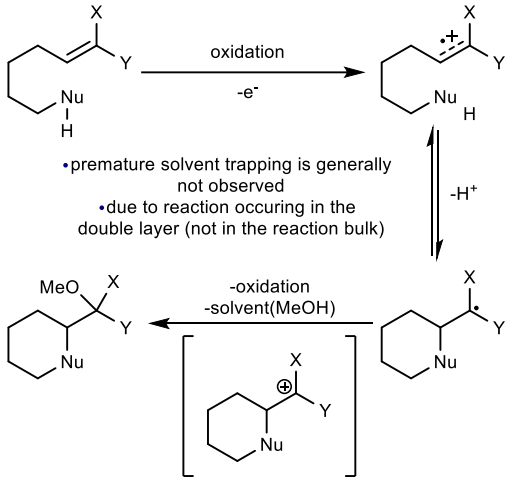


Chem. Lett. **1992**, *21* (4), 651–654. https://doi.org/10.1246/cl.1992.651.
Chem. Lett. **1993**, *22* (6), 1059–1062. https://doi.org/10.1246/cl.1993.1059.
Tetrahedron Letters **1999**, *40* (2), 299–302. https://doi.org/10.1016/S0040-4039(98)02295-3.

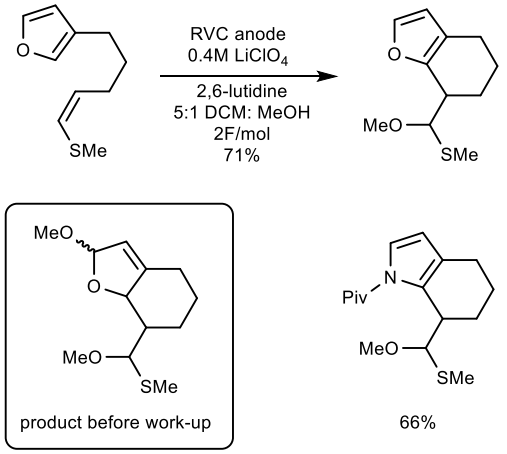


Tetrahedron **2000**, *56* (49), 9527–9554. https://doi.org/10.1016/S0040-4020(00)00840-1.

Mechanism:



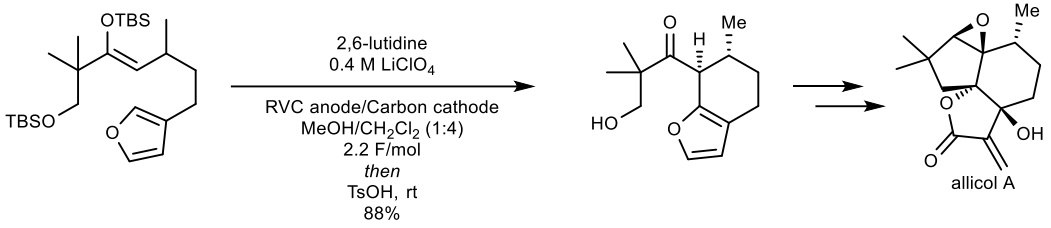
Furans as nucleophiles:



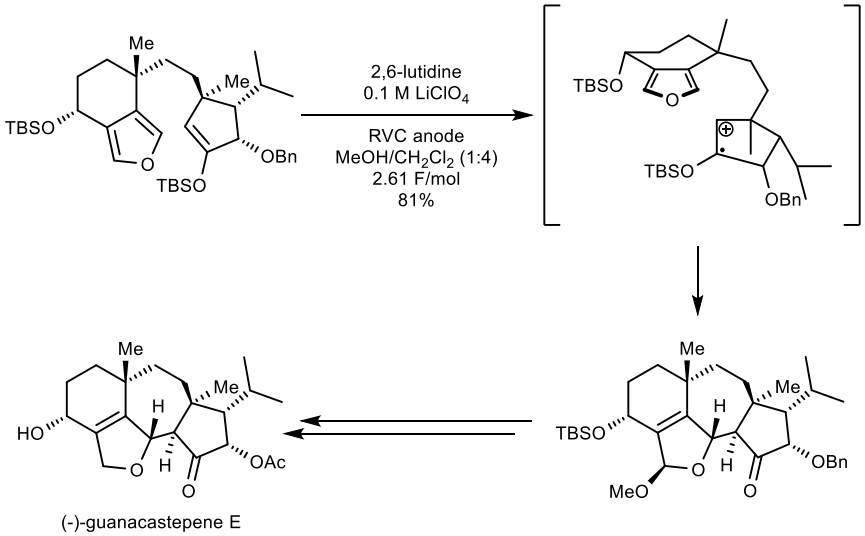
J. Org. Chem. **1996**, *61* (5), 1578–1598. https://doi.org/10.1021/jo9518359.

Anodic Olefin Cyclizations

Examples in total synthesis:

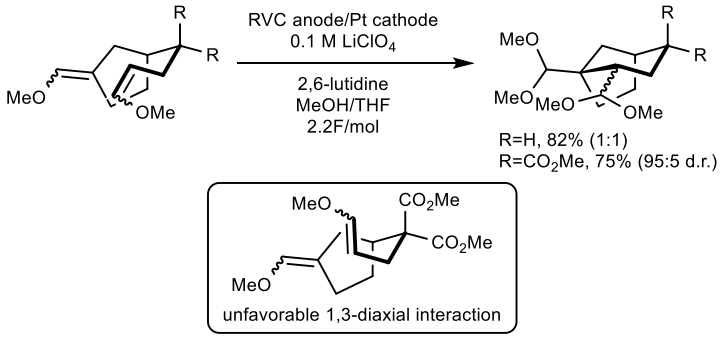


J. Am. Chem. Soc. **2004**, *126* (29), 9106–9111. https://doi.org/10.1021/ja048085h.

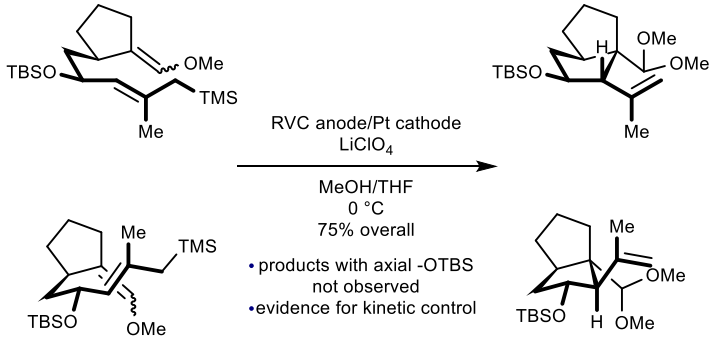


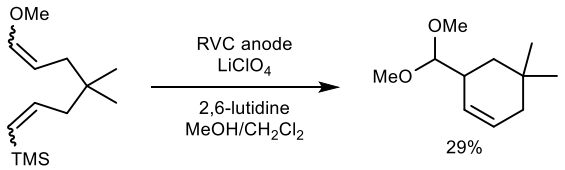
J. Am. Chem. Soc. **2006**, *128* (51), 17057–17062. https://doi.org/10.1021/ja0660507.

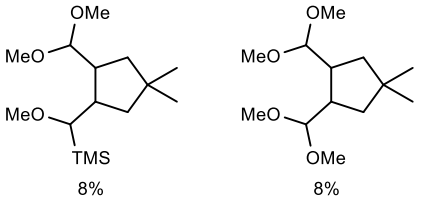
Stereochemical/kinetic considerations:



Tetrahedron Letters **1998**, *39* (44), 8027–8030. https://doi.org/10.1016/S0040-4039(98)01793-6.



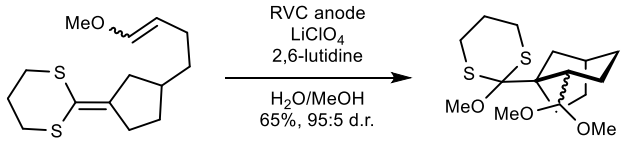


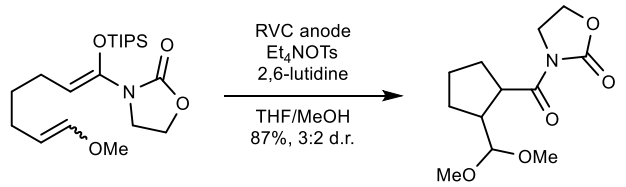


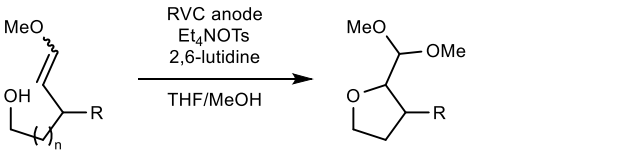
J. Am. Chem. Soc. **1994**, *116* (8), 3347–3356. https://doi.org/10.1021/ja00087a021.

Anodic Olefin Cyclizations

Coupling with enol ethers:

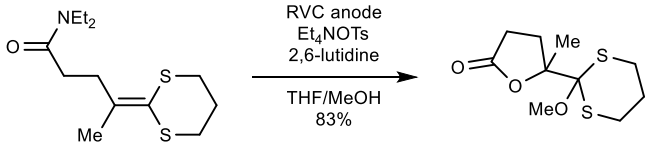




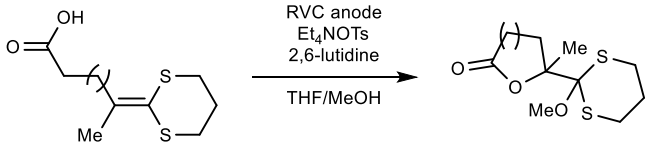


R= Me, n= 1, 96%, 5:1 trans: cis
R= CH_2Ph, n= 1, 95%, 10:1 trans:cis
R= H, n= 2, 80%
R= CH_2Ph, n= 2, 51%
R= H, n= 3, --

Olefin/amide anodic coupling:

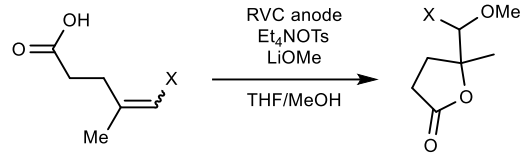


Olefin/carboxylic acid anodic coupling:



n= 1, 74%
n= 2, 72%

Tetrahedron Letters **2002**, *43* (40), 7159–7161. https://doi.org/10.1016/S0040-4039(02)01663-5.
Org. Lett. **2001**, *3* (11), 1729–1732. https://doi.org/10.1021/ol015925d.

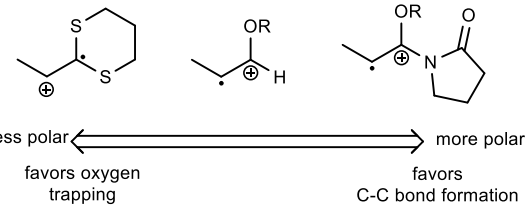


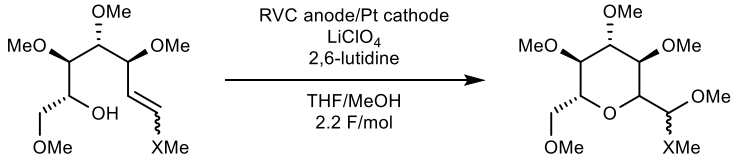
no competing Kolbe-type oxidations were observed

X=SMe, 74%
X=OMe, 66%
X=Ph, 27@ 10F/mol
X= 2,4-diOMeAr, 74% @ 1.0 equiv. LiOMe

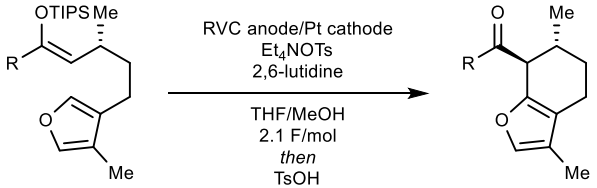
Beilstein J. Org. Chem. **2013**, *9* (1), 1630–1636. https://doi.org/10.3762/bjoc.9.186.
Tetrahedron **2009**, *65* (52), 10863–10875. https://doi.org/10.1016/j.tet.2009.09.028.

Studying the radical cation character:

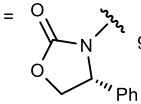




X = O, 0%
S, 71%, 1:1 d.r.



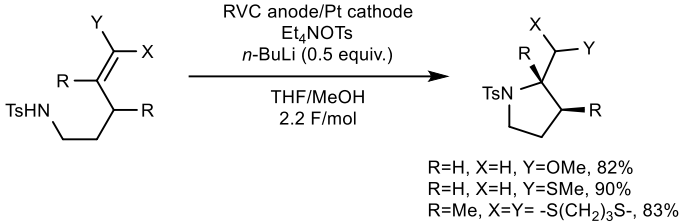
R = H, 30%

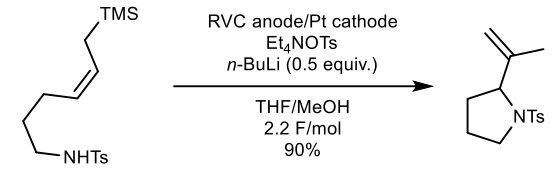


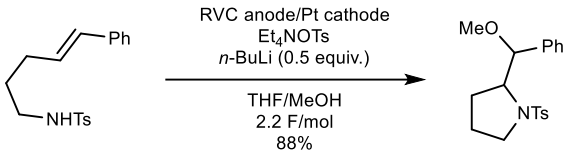
90 (66% isolated)

Anodic Olefin Cyclizations

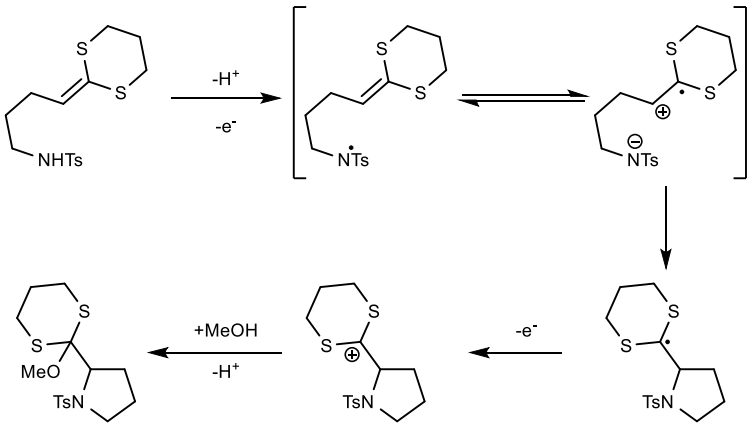
Olefin/amine anodic coupling:



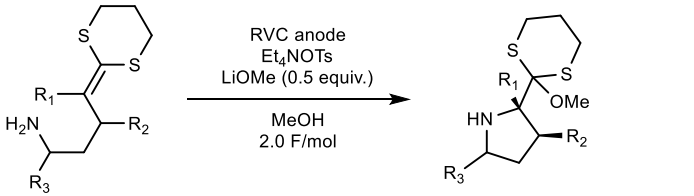




J. Am. Chem. Soc. **2008**, *130* (41), 13542–13543. https://doi.org/10.1021/ja806259z.

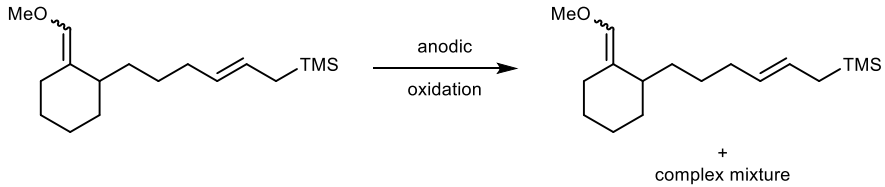


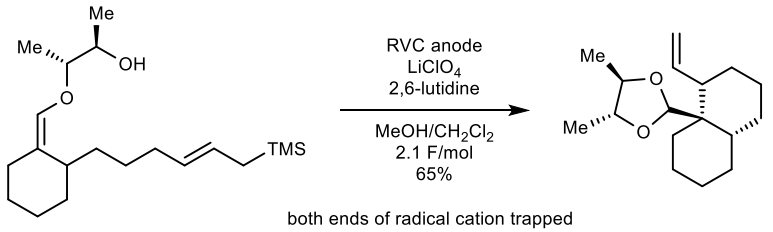
competiton experiments suggest that intermolecular electron transfer occurs



Angew. Chem. Int. Ed. **2013**, *52* (49), 12865–12868. https://doi.org/10.1002/anie.201308739.
Angew. Chem. Int. Ed. **2010**, *122* (43), 8176–8179. https://doi.org/10.1002/ange.201003924.

Secondary nucleophiles enables scope expansion:





Alternative trapping groups: