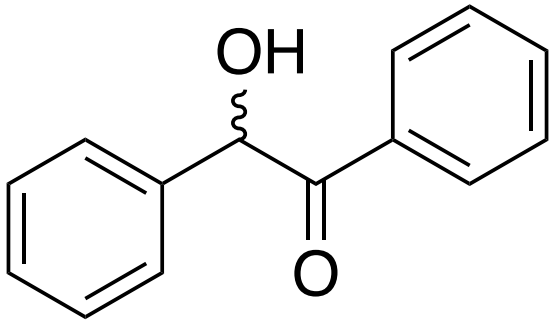
Universidad Nacional Autónoma de México

Química Orgánica III (1506)
Laboratorio
Semestre 2026 - 2

M. en C. Arturo García Zavala

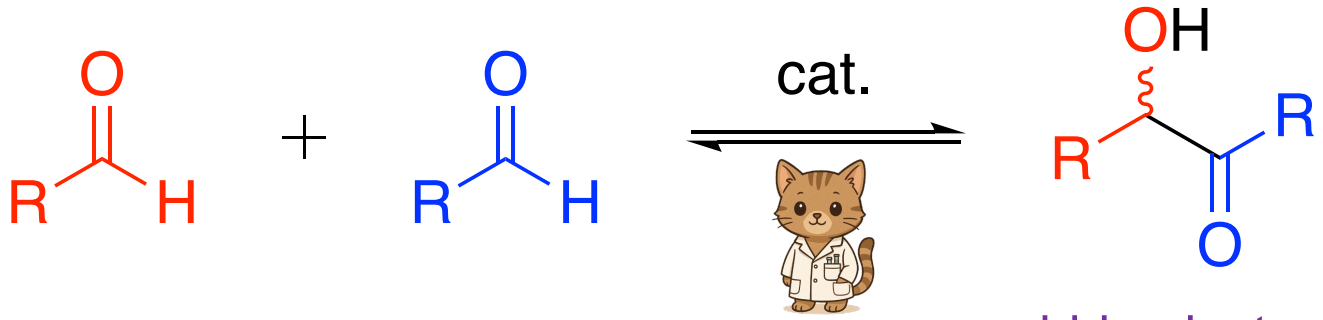


Práctica 9

Carbonilos III: Condensación benzoínica

29/04/2026

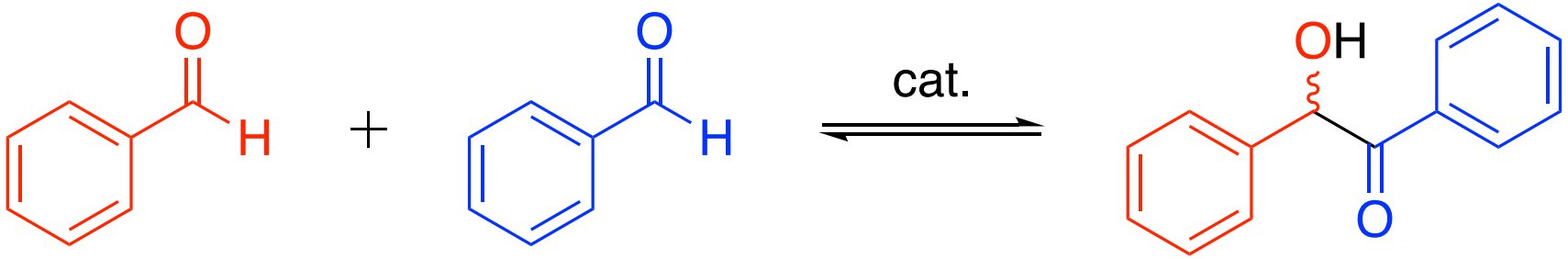
Reacción general:



cat. = NaCN, KCN, sales de tiazolio

α-hidroxicetona
(aciloína)

Reacción específica:

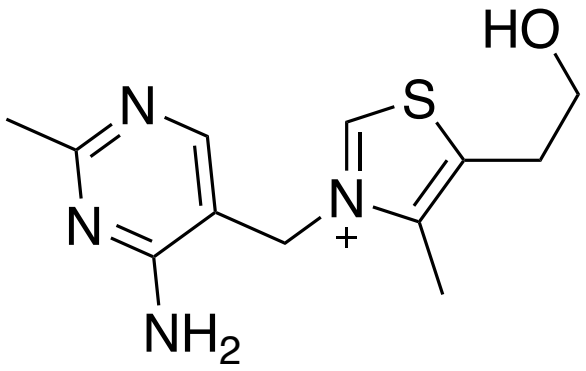


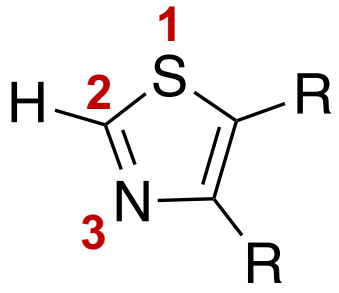
benzaldehído

cat. = tiamina

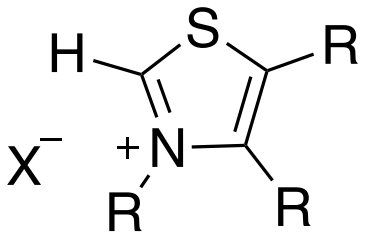
benzoína

Tiamina (Vitamina B1)

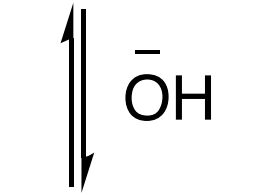


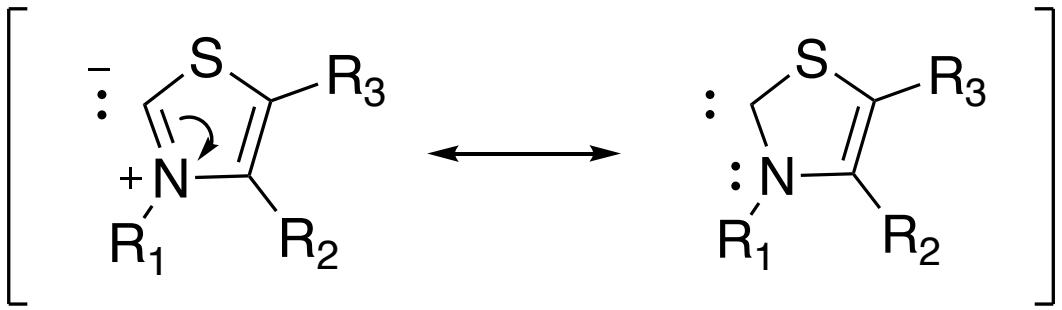


1,3-tiazol



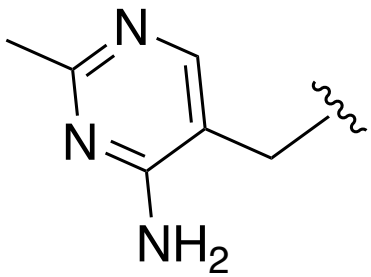
Sal de *N*-alquiltiazolio





iluro carbeno

R_1 =



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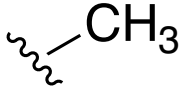

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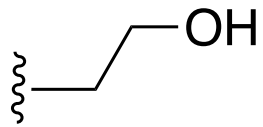
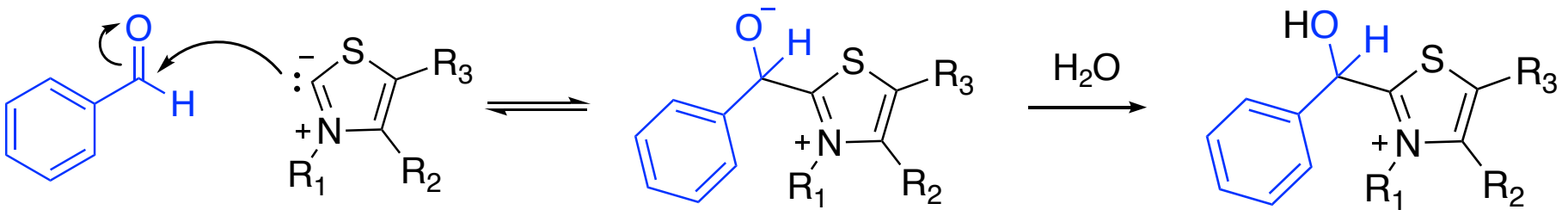
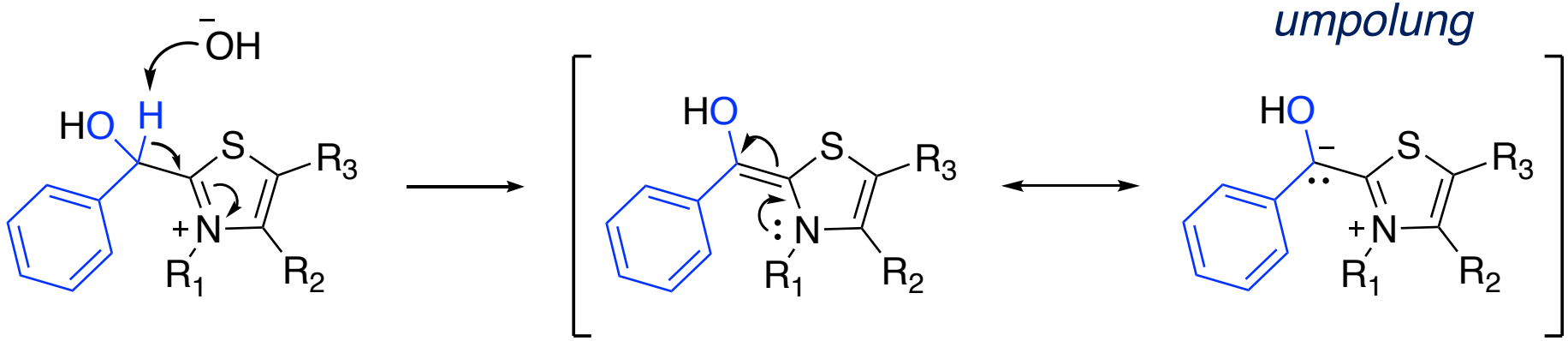


Mecanismo:

El anillo de tiazol actúa como un grupo electroatractor



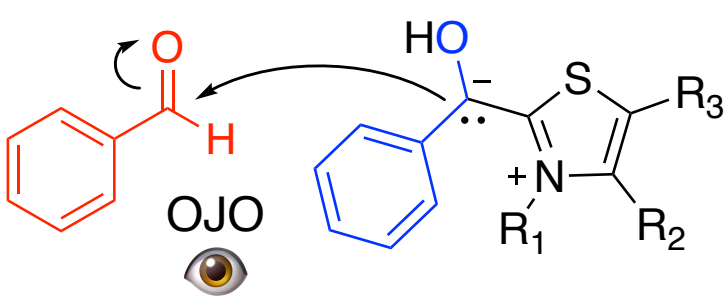


umpolung

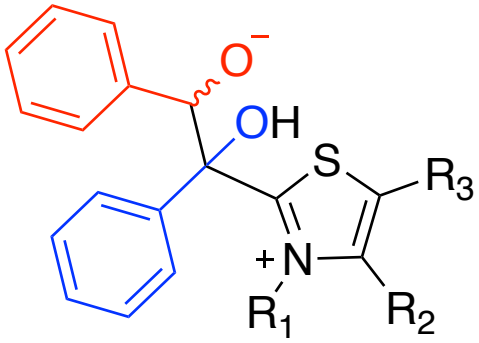
Intermediario de Breslow

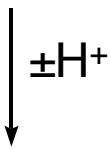
Breslow, R. On the Mechanism of Thiamine Action. IV.[1] Evidence from Studies on Model Systems. *J. Am. Chem. Soc.* **1958**, *80* (14), 3719–3726.

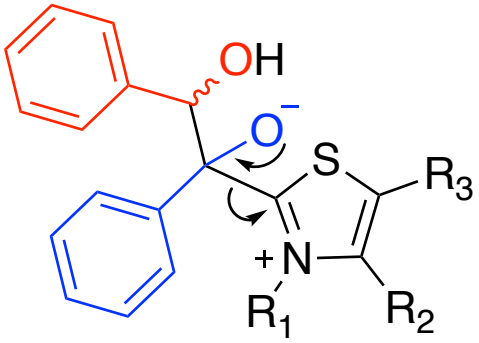
Mecanismo:



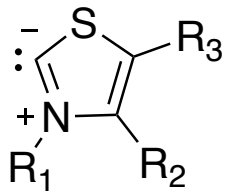
La adición puede ocurrir por la cara *Re* o la cara *Si*

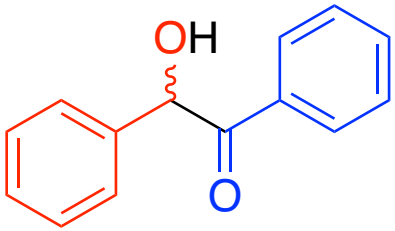






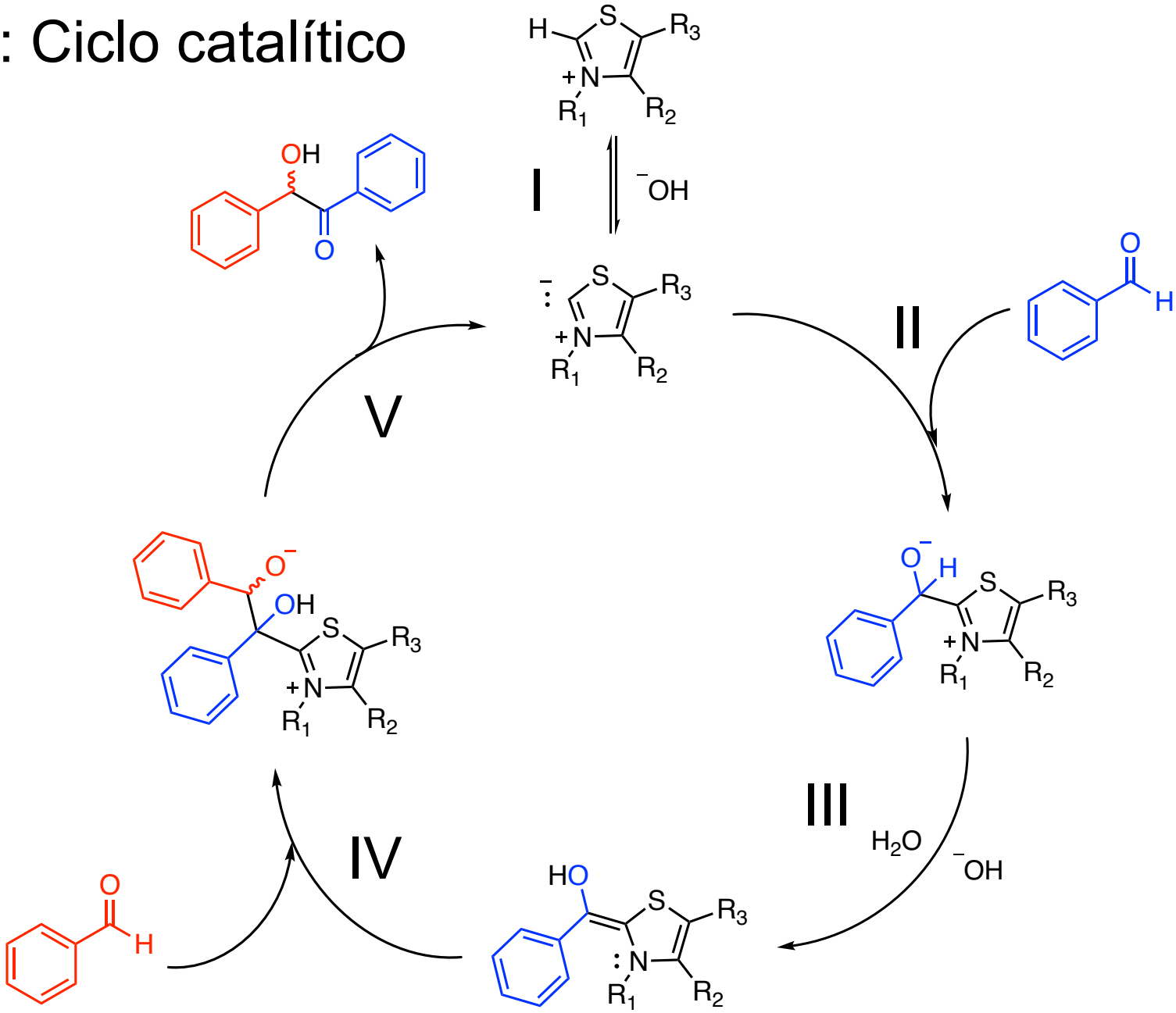
tiamina





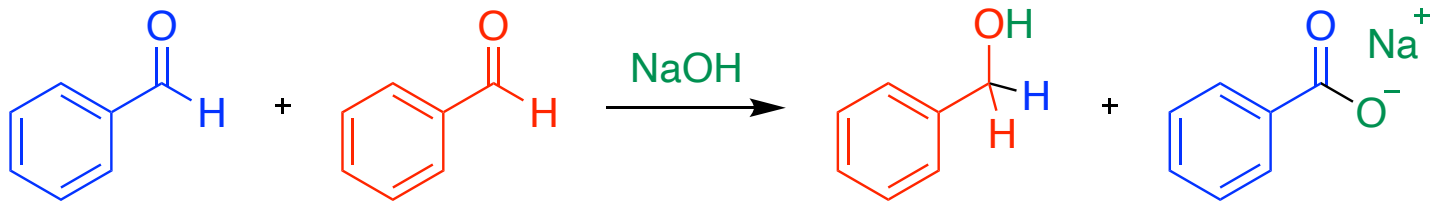
benzoína

Resumen: Ciclo catalítico

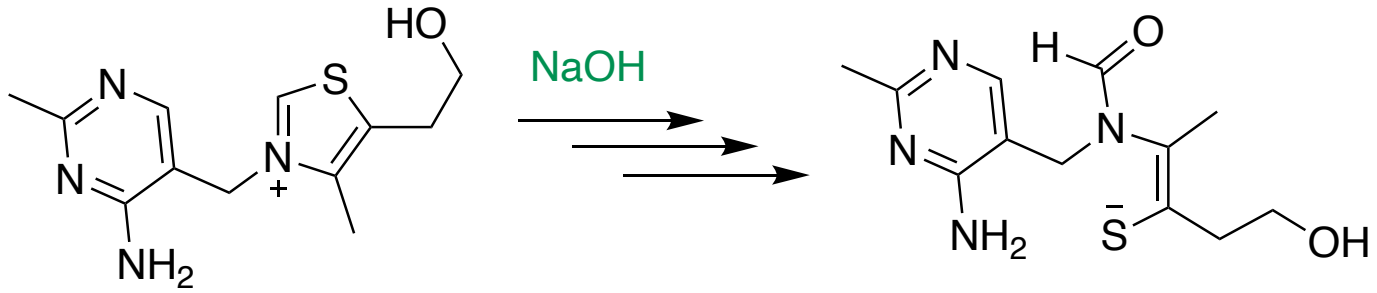


Consideraciones generales

Reacción colateral: Reacción de Cannizarro



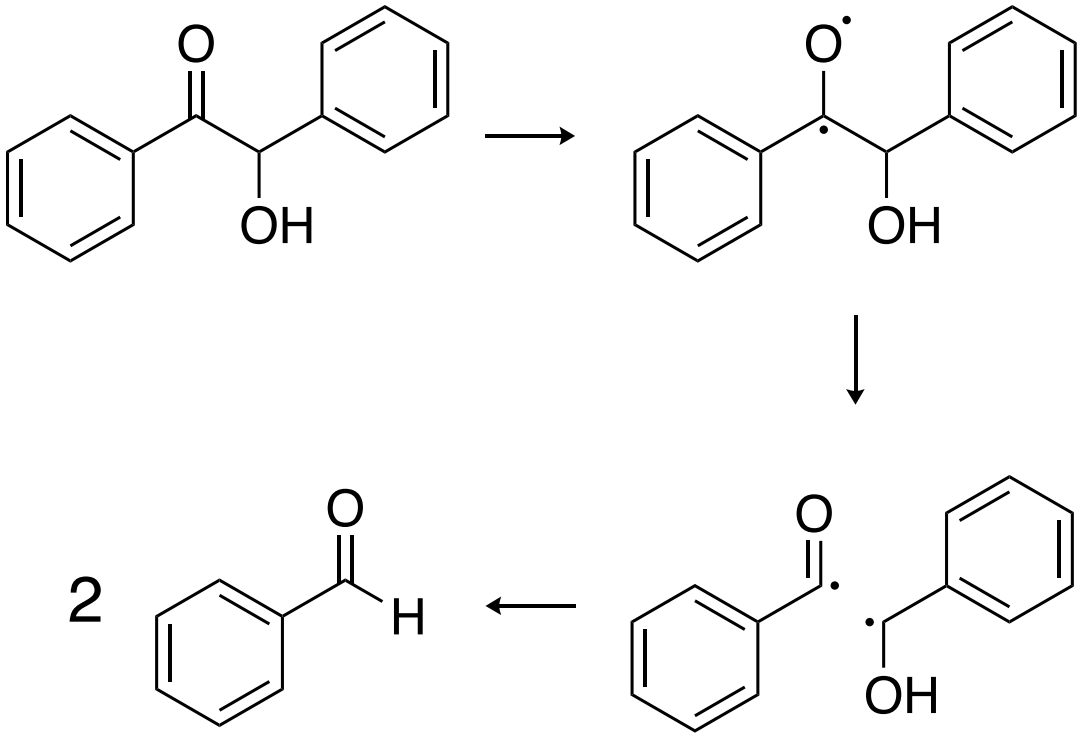
pH: Descomposición de la tiamina



Edwards, K. A.; Tu-Maung, N.; Cheng, K.; Wang, B.; Baeumner, A. J.; Kraft, C. E. Thiamine Assays—Advances, Challenges, and Caveats. *ChemistryOpen* **2017**, *6* (2), 178–191.

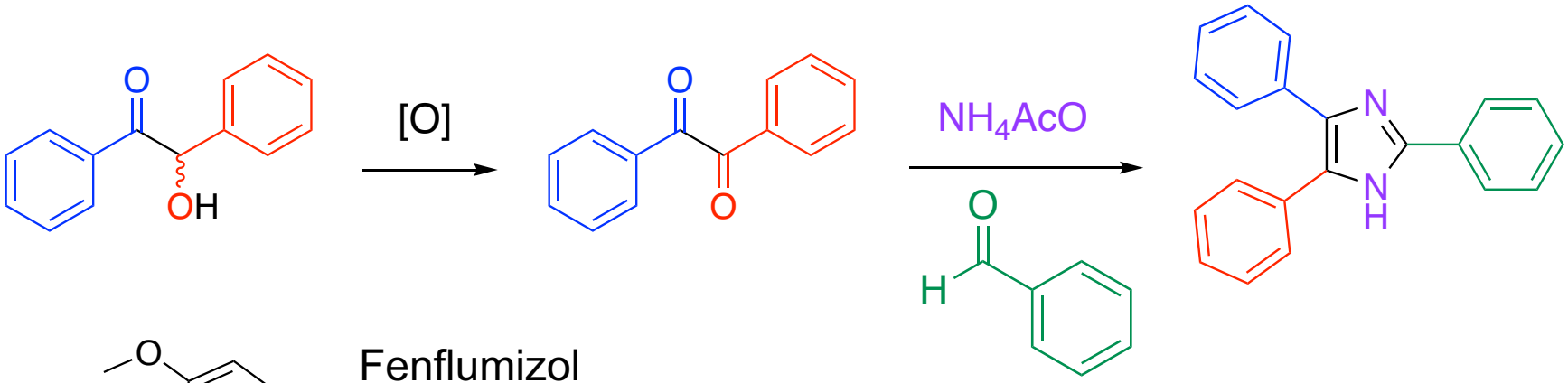
Consideraciones generales

Luz: Descomposición con luz

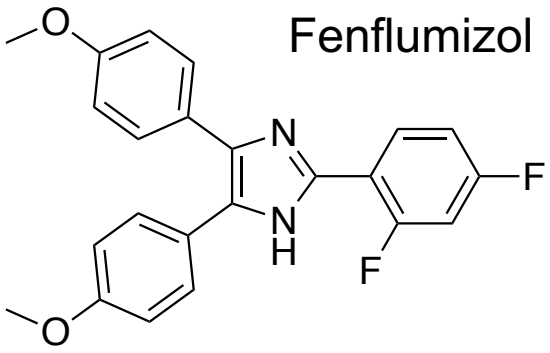


Ledwith, A.; Russell, P. J.; Sutcliffe, L. H. Radical Intermediates in the Photochemical Decomposition of Benzoin and Related Compounds. *J. Chem. Soc. Perkin Trans. 2* **1972**, No. 13, 1925–1928.

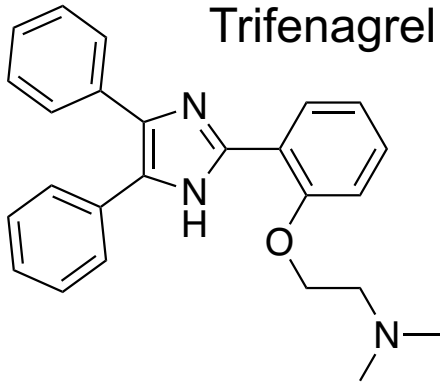
Derivados de benzoína utilizados como materias primas

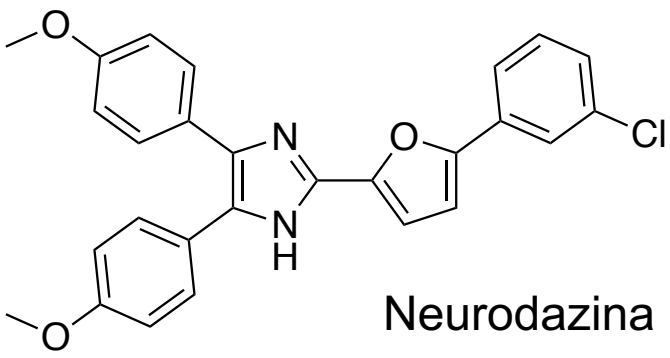


Fenflumizol



Trifenagrel





Neurodazina