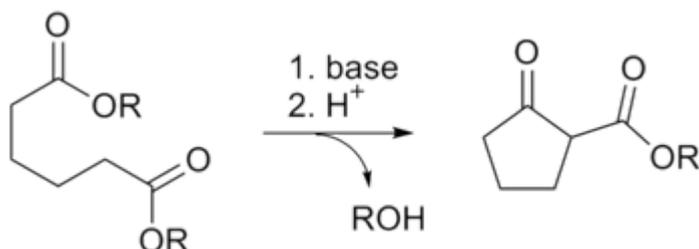


# Dieckmann condensation

The **Dieckmann condensation** is the intramolecular chemical reaction of diesters with base to give  $\beta$ -keto esters.<sup>[1]</sup> It is named after the German chemist Walter Dieckmann (1869–1925).<sup>[2][3]</sup> The equivalent intermolecular reaction is the Claisen condensation.



Dieckmann condensation	
Named after	Walter Dieckmann
Reaction type	Ring forming reaction
Identifiers	
Organic Chemistry Portal	<u>dieckmann-condensation</u>
RSC ontology ID	<u>RXNO:0000065</u>

## Contents

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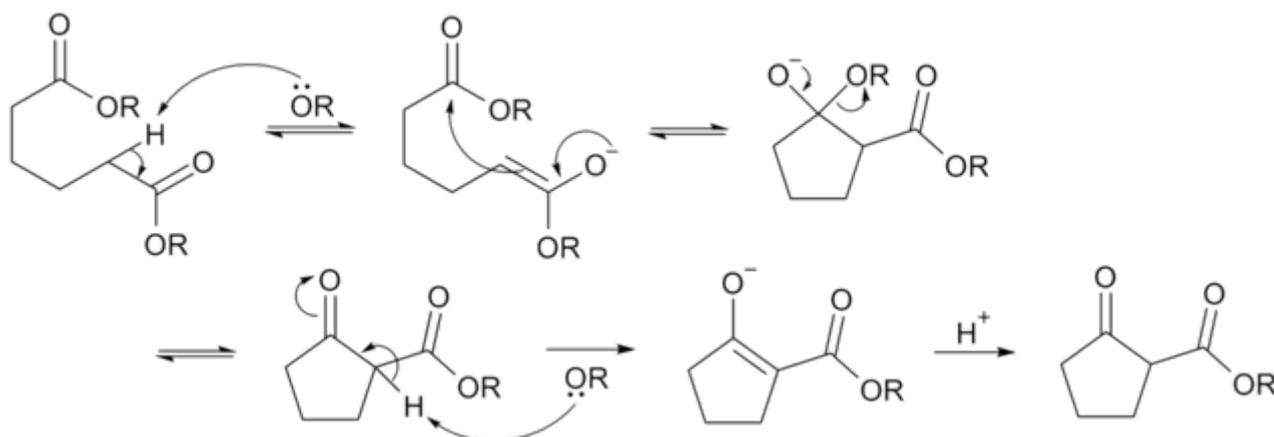
[Further reading](#)

[See also](#)

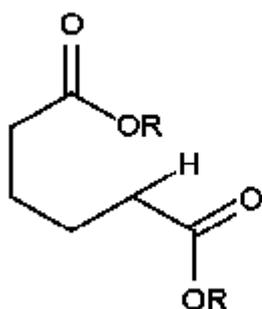
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## Reaction mechanism

Deprotonation of an ester at the  $\alpha$ -position generates an enolate ion which then undergoes a 5-exo-trig nucleophilic attack to give a cyclic enol. Protonation with a Brønsted-Lowry acid ( $H_3O^+$  for example) reforms the  $\beta$ -keto ester.<sup>[4]</sup>



Due to the steric stability of five- and six-membered rings, these structures will preferentially be formed. 1,6 diesters will form five-membered cyclic  $\beta$ -keto esters, while 1,7 diesters will form six-membered  $\beta$ -keto esters.<sup>[5]</sup>



Animation of the reaction mechanism

## Further reading

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- Dieckmann, W. *Ber.* 1894, 27, 102 & 965
- Dieckmann, W. *Chemische Berichte*|*Ber.* 1900, 33, 595 & 2670
- Dieckmann, W. *Ann.* 1901, 317, 51 & 93

## See also

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- Claisen condensation
- Gabriel-Colman rearrangement
- Thorpe–Ziegler reaction

## References

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2. Kwart, Harold; King, Kenneth (1969). "Rearrangement and cyclization reactions of carboxylic acids and esters". In S. Patai (ed.). *PATAI'S Chemistry of Functional Groups: Carboxylic Acids and Esters (1969)*. pp. 341–373. doi:10.1002/9780470771099.ch8 (<https://doi.org/10.1002%2F9780470771099.ch8>). ISBN 9780470771099.
3. Schaefer, J. P.; Bloomfield, J. J. (1967). "The Dieckmann Condensation (Including the Thorpe-Ziegler Condensation)". *Organic Reactions*. **15**: 1–203. doi:10.1002/0471264180.or015.01 (<https://doi.org/10.1002%2F0471264180.or015.01>).
4. Janice Gorzynski Smith (2007). *Organic Chemistry* ([https://archive.org/details/organicchemistry00smit\\_600](https://archive.org/details/organicchemistry00smit_600)) (2nd ed.). pp. 932 ([https://archive.org/details/organicchemistry00smit\\_600/page/n968](https://archive.org/details/organicchemistry00smit_600/page/n968))–933. ISBN 978-0073327495.
5. "Dieckmann Condensation" (<https://www.organic-chemistry.org/namedreactions/dieckmann-condensation.shtml>). Organic Chemistry Portal.

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