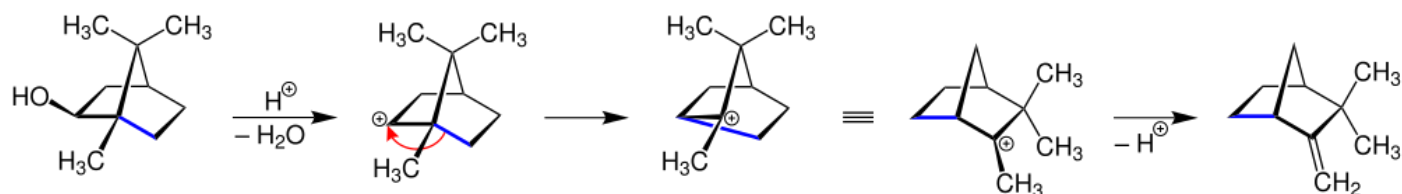


## Wagner–Meerwein rearrangement

A **Wagner–Meerwein rearrangement** is a class of carbocation 1,2-rearrangement reactions in which a hydrogen, alkyl or aryl group migrates from one carbon to a neighboring carbon.<sup>[1][2]</sup> They can be described as cationic [1,2]-sigmatropic rearrangements, proceeding suprafacially and with stereochemical retention. As such, a Wagner–Meerwein shift is a thermally allowed pericyclic process with the Woodward-Hoffmann symbol  $[\omega_0s + \sigma_2s]$ . They are usually facile, and in many cases, they can take place at temperatures as low as  $-120\text{ }^{\circ}\text{C}$ . The reaction is named after the Russian chemist Yegor Yegorovich Vagner; he had German origin and published in German journals as Georg Wagner; and Hans Meerwein.

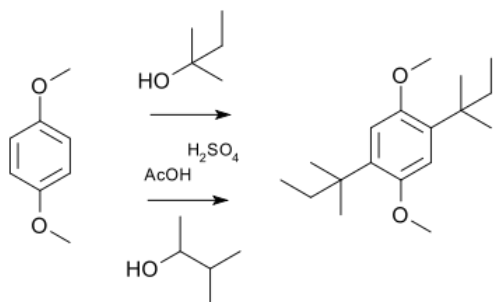
Several reviews have been published.<sup>[3][4][5][6][7]</sup>

The rearrangement was first discovered in bicyclic terpenes for example the conversion of isoborneol to camphene.<sup>[8]</sup>

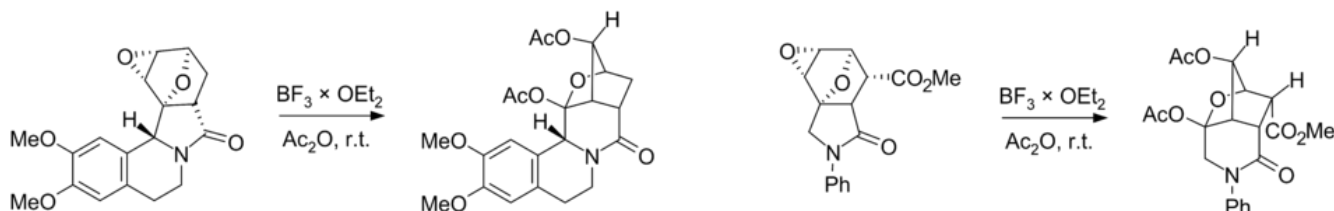


The story of the rearrangement reveals that many scientists were puzzled with this and related reactions and its close relationship to the discovery of carbocations as intermediates.<sup>[9]</sup>

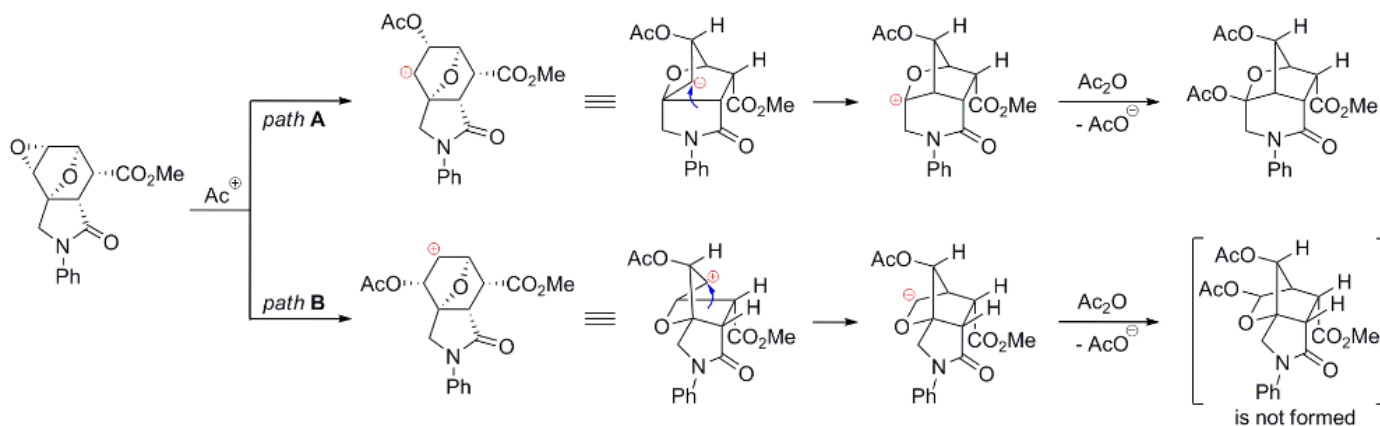
In a simple demonstration reaction of 1,4-dimethoxybenzene with either 2-methyl-2-butanol or 3-methyl-2-butanol in sulfuric acid and acetic acid yields the same disubstituted product,<sup>[10]</sup> the latter via a hydride shift of the cationic intermediate:



Currently, there are works relating to the use of skeletal rearrangement in the synthesis of bridged azaheterocycles. These data are summarized in <sup>[11]</sup>



Plausible mechanisms of the Wagner–Meerwein rearrangement of diepoxyisoindoles:



The related **Nametkin rearrangement** named after Sergey Namyotkin involves the rearrangement of methyl groups in certain terpenes. In some cases the reaction type is also called a **retropinacol rearrangement** (see Pinacol rearrangement).

## See also

- [Demjanov rearrangement](#)
- [Pinacol rearrangement](#)

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