Strychnine

Sodiq Adeyeye Nafiu

CEM 852

01/19/21

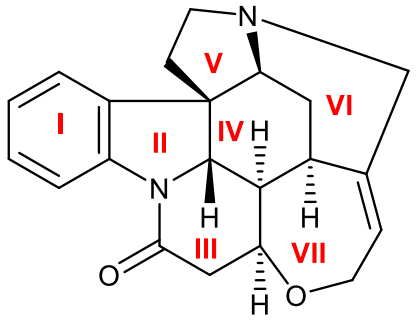
Woodward, R. B . ; Cava, M. P.; Ollis, W. D.; Hunger, A.; Daeniker, H. U.; Schenker, K. *J. Am. Chem. Soc.* **1954**, 76, 4749-4751.
Woodward, R. B.; Cava, M. P. ; Ollis, W. D.; Hunger, A.; Daeniker, H. U.; Schenker, K. *Tetrahedron* **1963**, 19, 247-288.

History of Strychnine

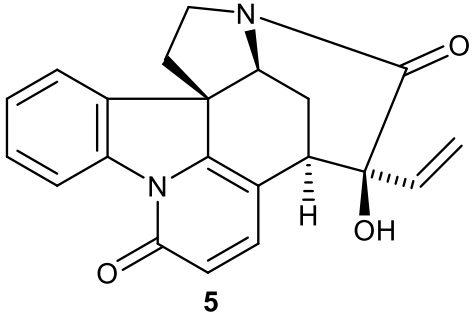
- Strychnine poison: alkaloid.
- Produced by *Strychnos* species in the rain forests of the South east Asian archipelagos and Coromandel Coast of India.
- First isolated by Pelletier and Caventou in 1818 from *Strychnos ignatii*
- First chemical synthesis was achieved by R. B. Woodward and his colleagues at Harvard in 1954.

Pelletier, P. J.; Caventou, J. B. *Ann. Chim. Phys.* **1818**, 8, 323.

Retrosynthesis Analysis



1: Strychnine



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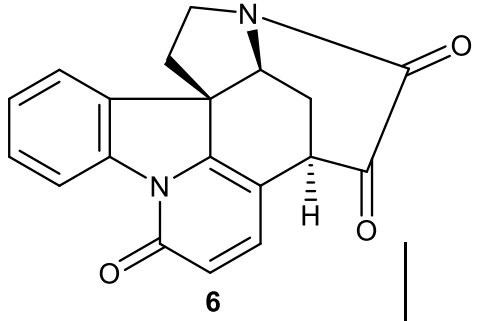

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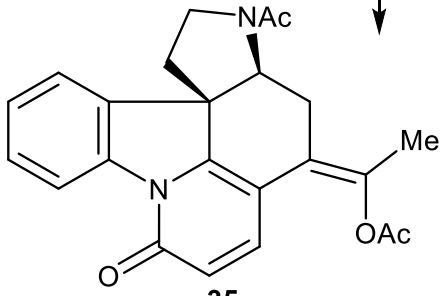

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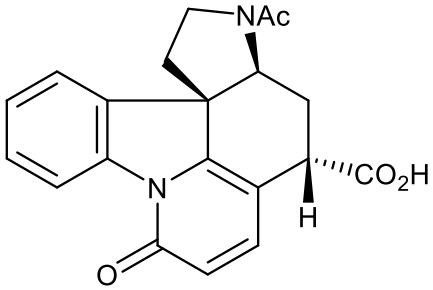

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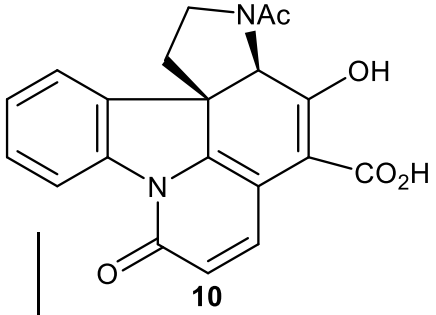

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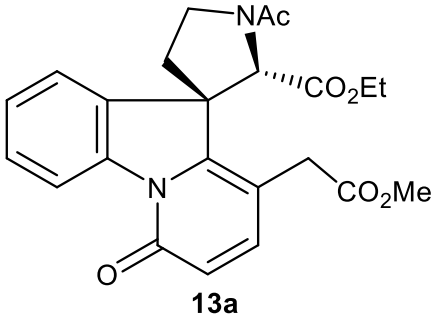
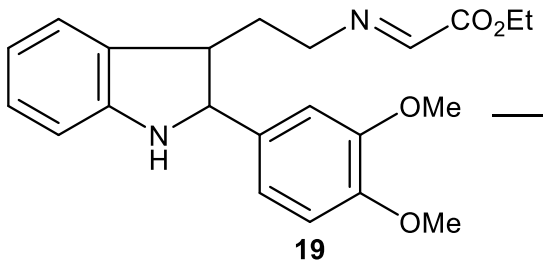


13a



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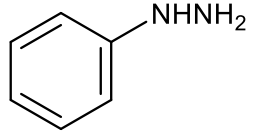

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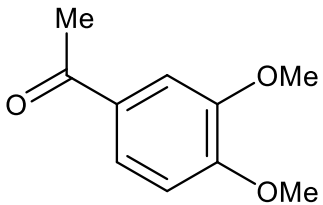

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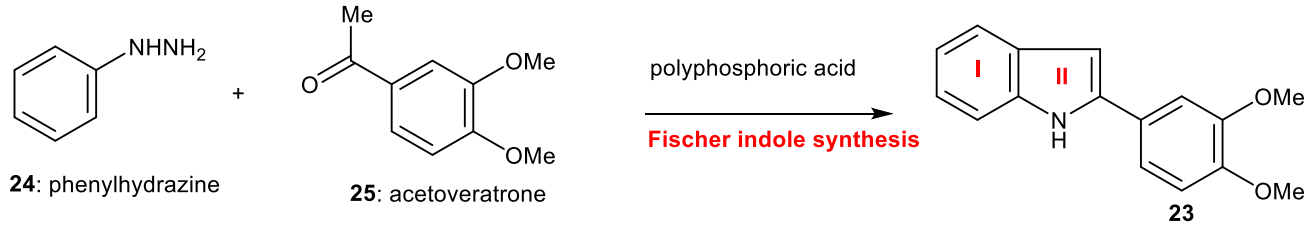
Synthesis of Intermediate 23

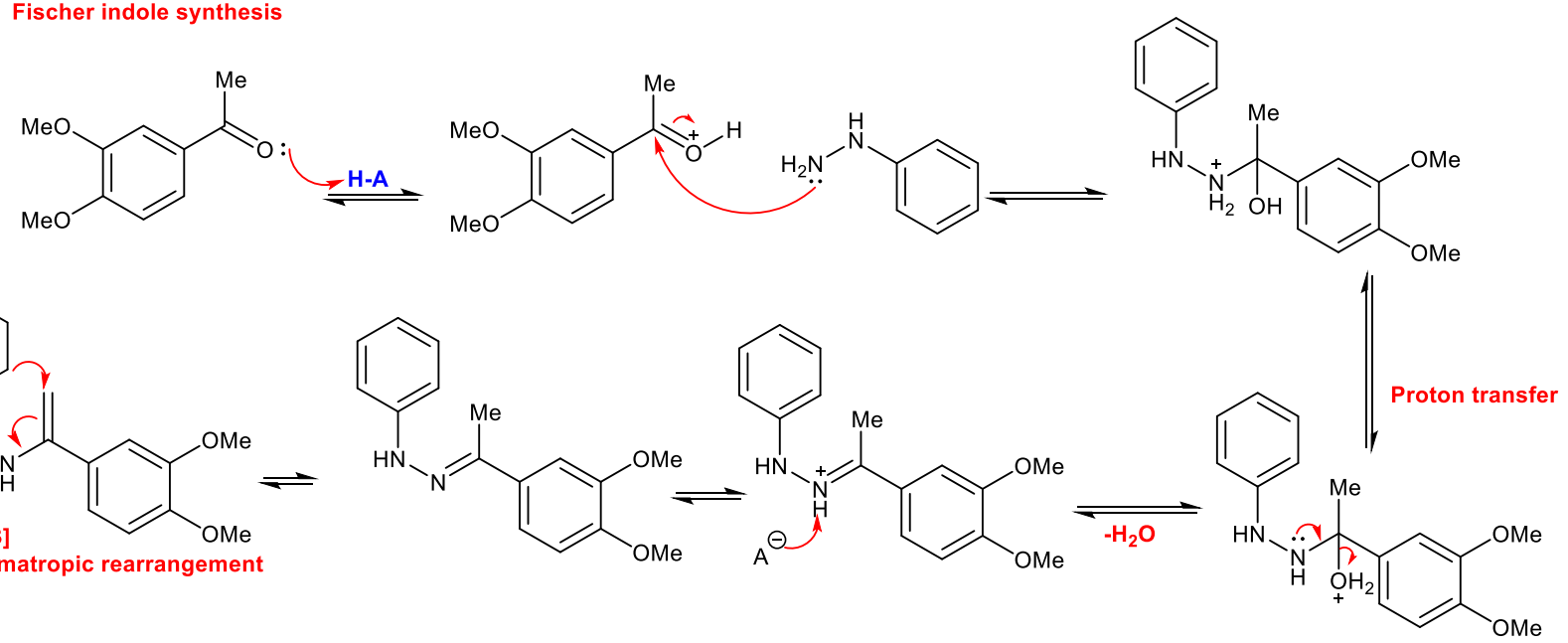


24: phenylhydrazine

25: acetoveratrone

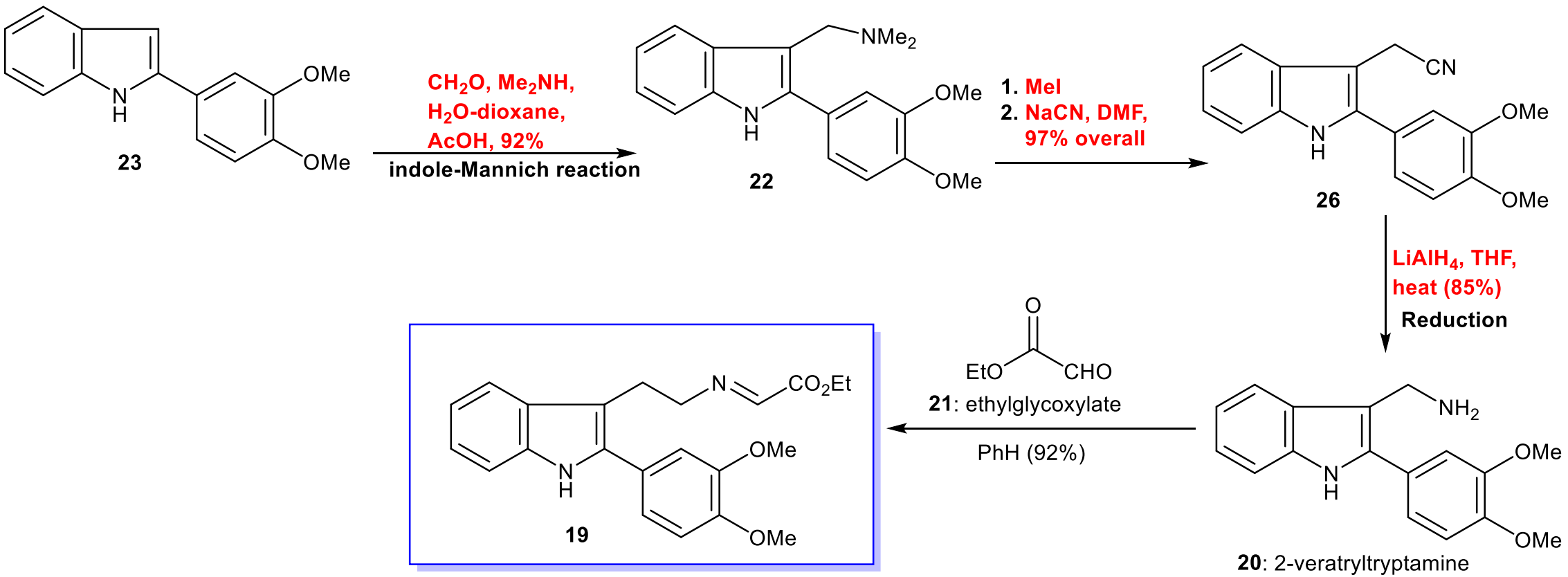
23

Fischer indole synthesis

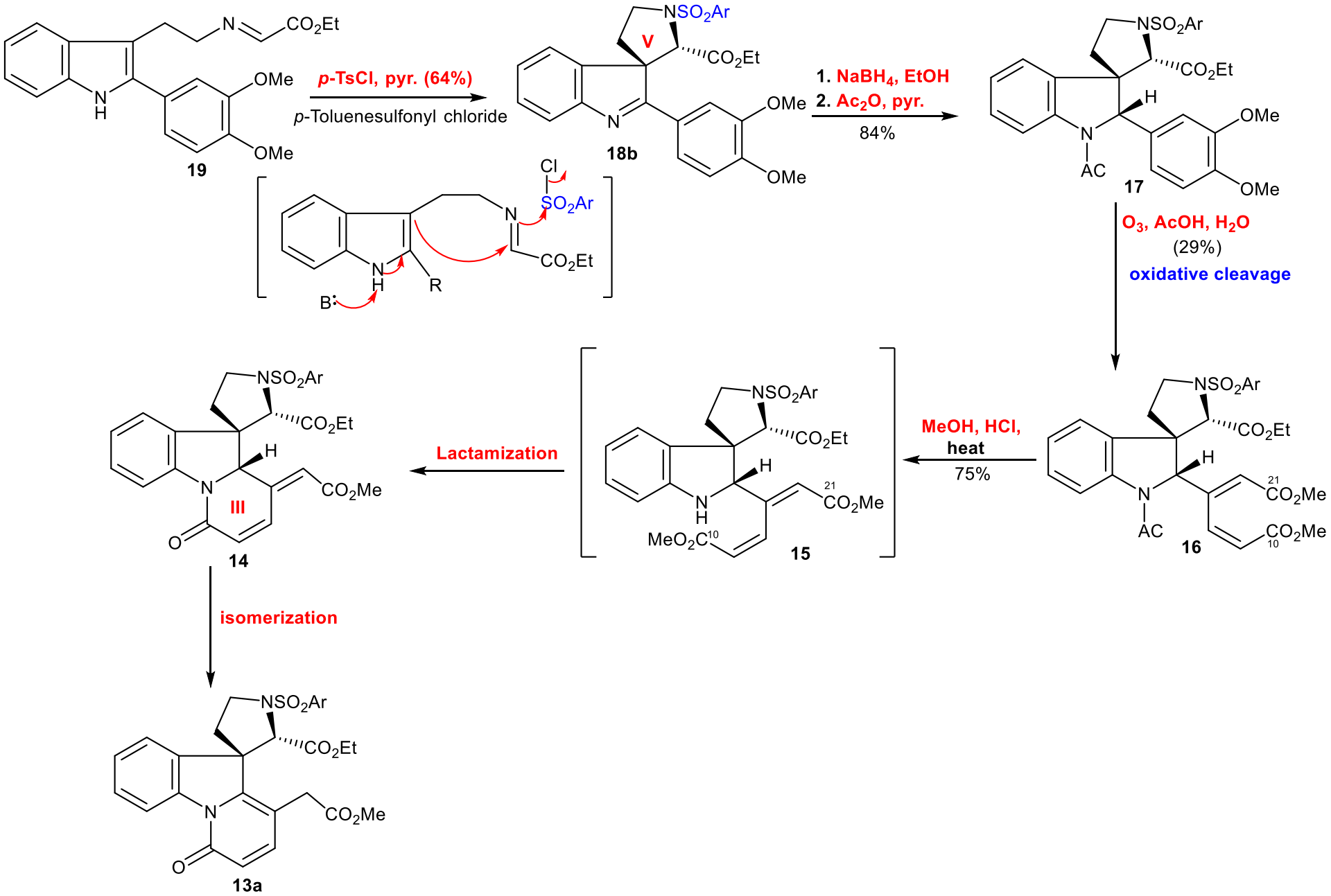


23: 2-veratrylindole

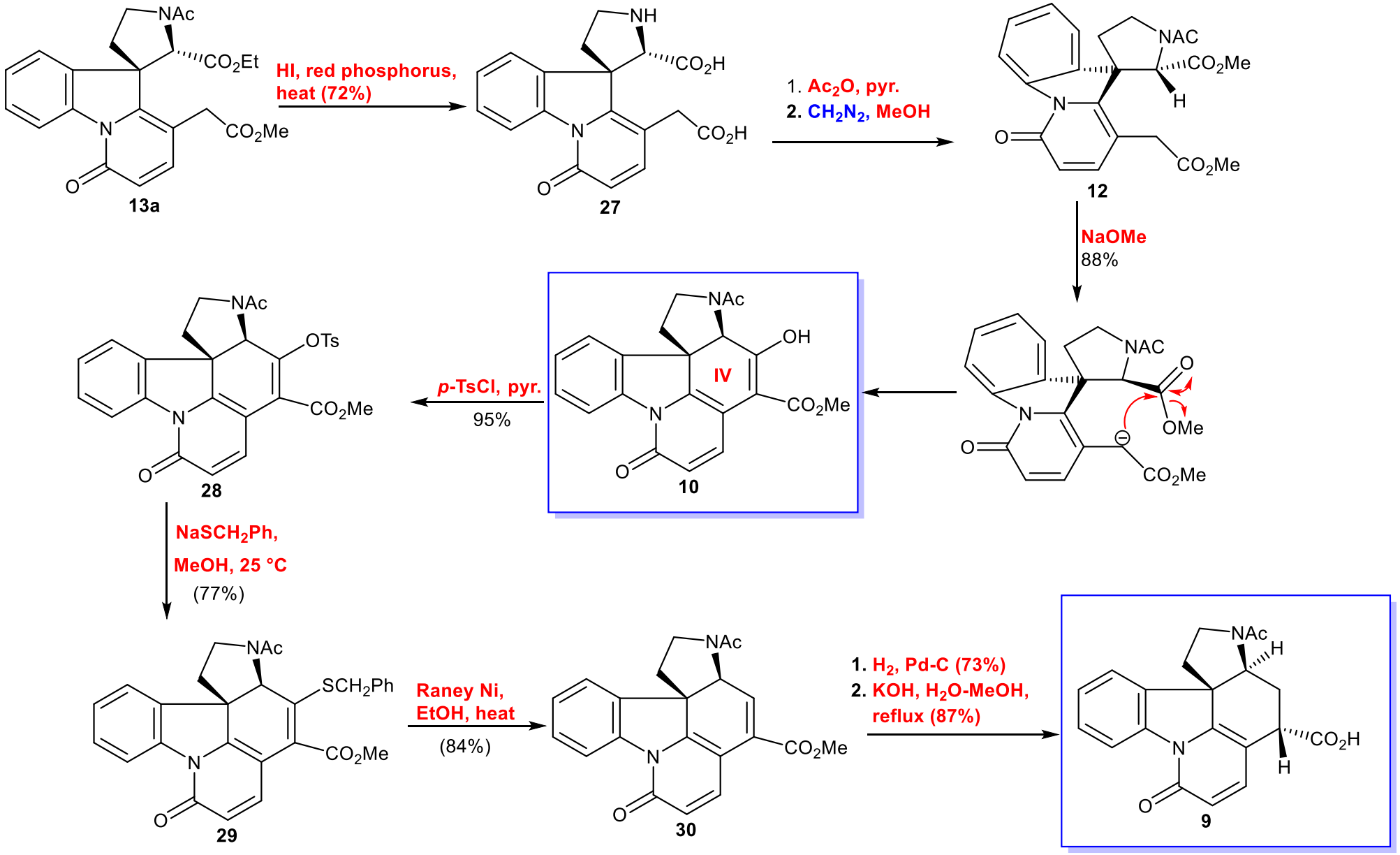
Synthesis of Intermediate 19



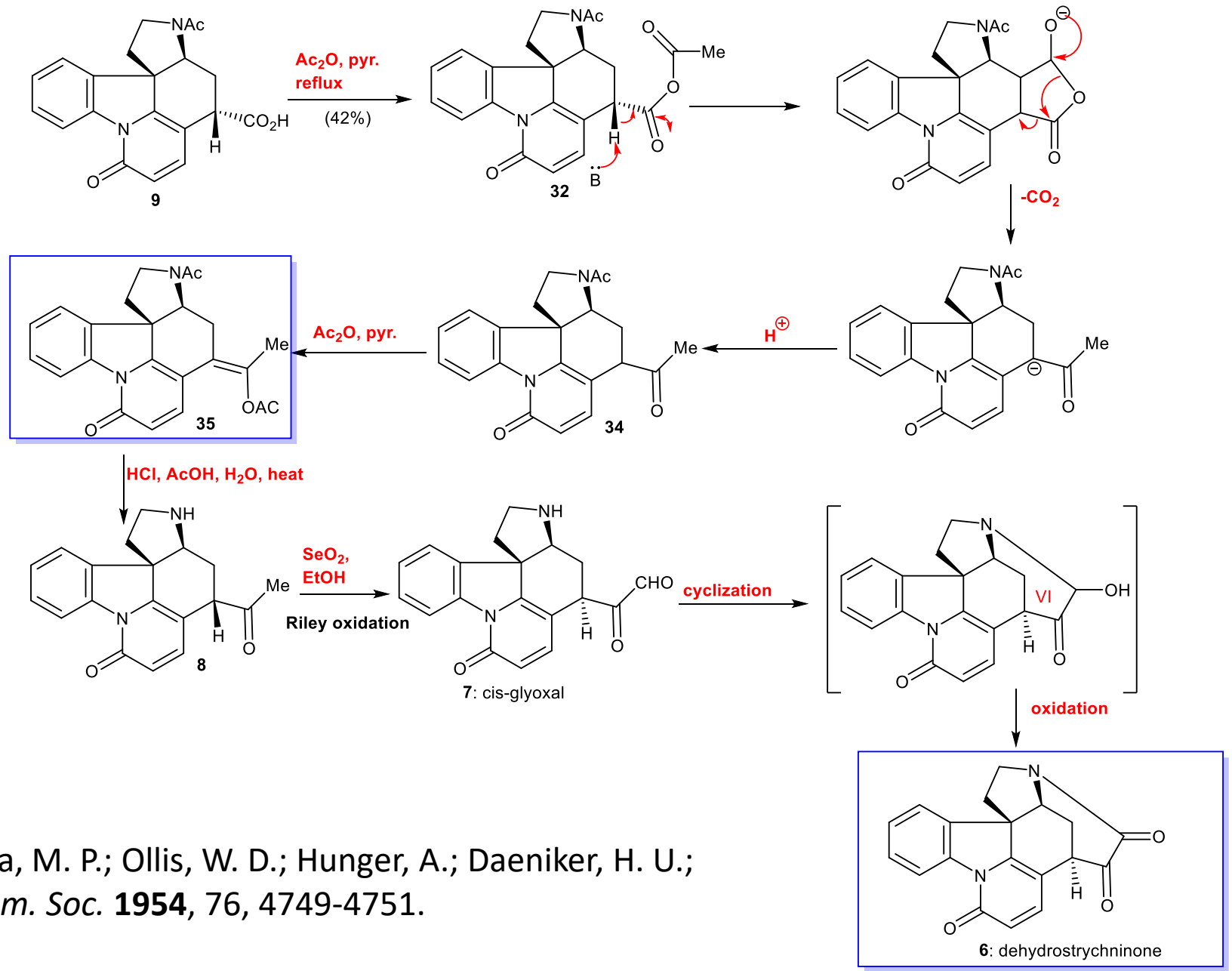
Synthesis of Intermediate 13a



Synthesis of Intermediates 10 and 9



Synthesis of Intermediates 35 and 6



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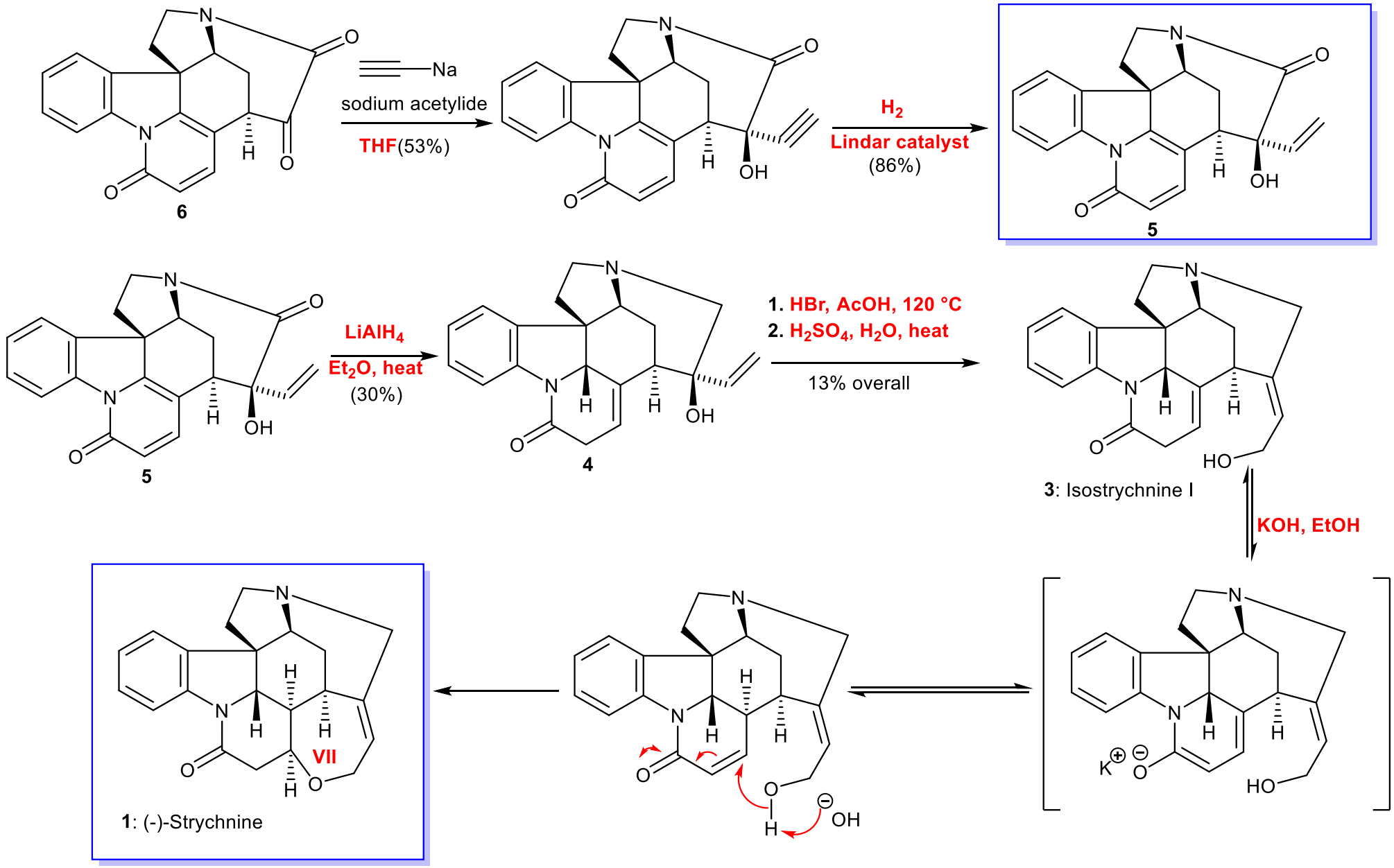
Synthesis of Intermediate 5 and Strychnine



Conclusion

- ✓This chemical synthesis of strychnine is a spectacular achievement in organic synthesis.
- ✓It shows that the nature's most complicated molecules could be made by total synthesis.
- ✓The most striking feature of this milestone accomplishment by Woodward *et al.* is its enforced reliance on only simple reagents to carry out nontrivial structural transformations.
- ✓The most interesting was the oxidative cleavage of the veratryl ring in intermediate **17**.
- ✓This daring transformation can be probably traced to Woodward's novel proposal that the oxidative scission of an aromatic ring may constitute a key step in the biosynthesis of the *Strychnos* alkaloids.

Woodward, R . B . *Nature (*London*)* **1948**, 162, 155.

THANKS FOR LISTENING