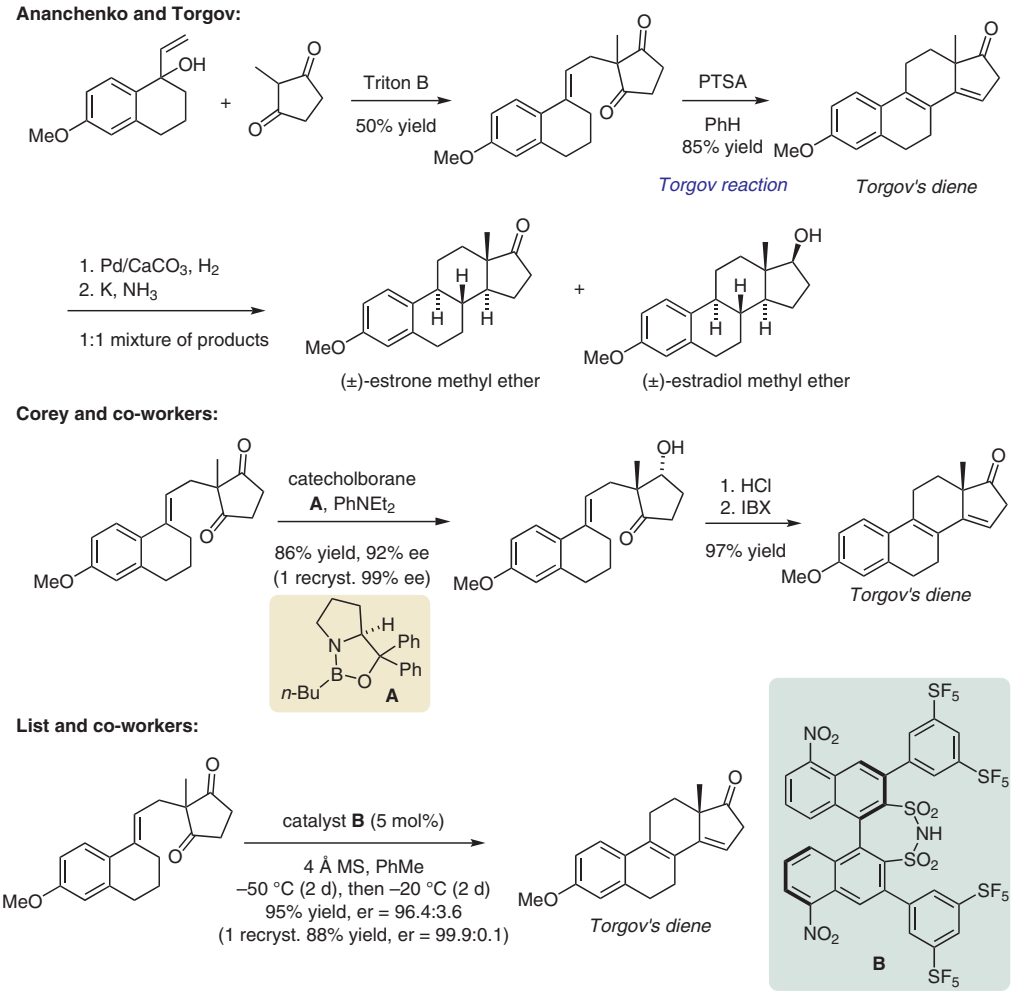
S. N. ANANCHENKO, I. V. TORGOV* (USSR ACADEMY OF SCIENCE, MOSCOW, USSR)
New Syntheses of Estrone, d,l-8-Iso-oestrone and d,l-19-Nortestosterone
Tetrahedron Lett. **1963**, *4*, 1553–1558.

Torgov Cyclization



Significance: In 1963, Ananchenko and Torgov described the carbocyclization of an achiral diketone to give a tetracyclic intermediate (Torgov's diene) that provided an early pathway for the total synthesis of steroid hormones. This method has been used for the industrial-scale production of certain steroids. However, an enantioselective variant of the Torgov reaction has long remained elusive.

Comment: Corey and co-workers reported an enantioselective and diastereoselective reduction of the achiral diketone by using an oxazaborolidine catalyst **A** (*J. Am. Chem. Soc.* **2007**, *129*, 10346). Treatment of the mono-ketone with methanolic HCl followed by IBX oxidation gave Torgov's diene in high optical purity. List and co-workers developed a catalytic asymmetric Torgov cyclization using a novel dinitro-substituted disulfonimide catalyst **B** (*Angew. Chem Int. Ed.* **2014**, *53*, 8770).

SYNFACTS Contributors: Dirk Trauner, Andrej Shemet
Synfacts 2019, 15(12), 1443 Published online: 18.11.2019
DOI: 10.1055/s-0039-1691123; **Reg-No.:** T11119SF

Category
Chemistry in Medicine and Biology

Key words
steroids
asymmetric synthesis
disulfonimide

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