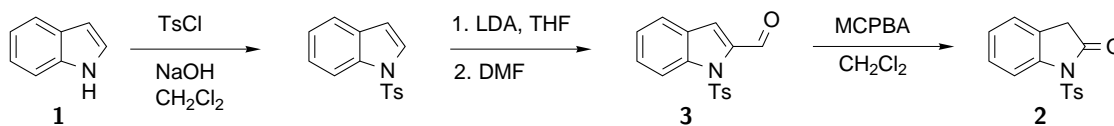


## Synthesis of Protected Oxindole

### Overview

In this organic synthesis project, you will protect the nitrogen of indole (**1**) as a tosylate, and oxidize the 2-position of the resulting compound to produce 1-tosyloxindole, **2**.



Oxindoles are useful building blocks for indole chemistry. In addition, they exhibit a wide range of physiological activities, including antiviral, antifungal, antibacterial, anticancer, antihypertensive, anti-inflammatory, and anticonvulsant effects. Moreover, some compounds in this family have found use as anti-HIV agents.<sup>1</sup>

A convenient, albeit novel, preparation of oxindoles proceeds through Baeyer-Villiger chemistry: acylation of N-protected indole leads to aldehyde **3**, which, on treatment with MCPBA and hydrolysis, produces oxindole **2**. Protection of the nitrogen is necessary to prevent deprotonation and acylation of the indole nitrogen during the LDA/DMF step.

Given the ingenuity of this reaction sequence, significant intermediates for all steps should be shown in your report, in addition to the net reaction.

### References

The references below describe the preparation of 1-benzenesulfonyloxindole. The tosyl analogue is suggested here to help keep the aromatic region of the NMR spectra tractable, but either preparation may be performed.

The Saulnier article below may be obtained through the Library's website. As the other two are from journals to which the library does not subscribe, they have been scanned and included in this directory.

#### Protection

Conway, S.C.; Gribble, G.W. *Heterocycles* **1990**, *30*, 627-663.

- Reduce the scale of the preparation, to use 5 g of indole.

#### Acylation

Saulnier, M.G.; Gribble, G.W. *J. Org. Chem.* **1982**, *47*, 757-761.

- Prepare compound **11d** analogously to **11e**. Don't worry about the fancy glassware used in the paper (\$\$\$).
- Although this paper also contains a preparation of the protected indole, it is less convenient than the Conway/Gribble route.

#### Baeyer-Villiger Oxidation

Bourlot, A.S.; Desarbres, E.; M  rour, J.Y. *Synthesis* **1994**, 411-416.

<sup>1</sup> Rudrangi, S.R.S.; Bontha, V.K; Manda, V.R.; Bethi, S. *Asian J. Research Chem.* **2011**, *4*, 335-338.