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Highly Diastereoselective Deuteration of 2-*p*-Tolylsulfinyl Ethylbenzene at Benzylic Position

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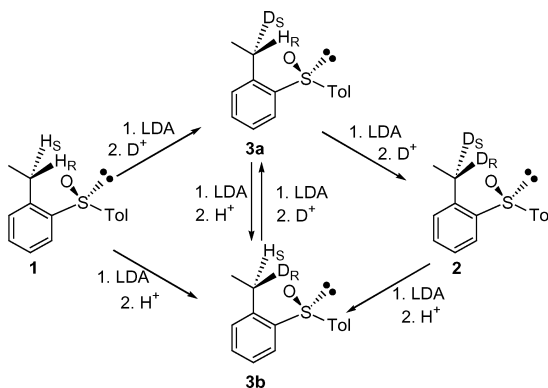
Highly Diastereoselective Deuteration of 2-*p*-Tolylsulfinyl Ethylbenzene at Benzylic Position

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The sulfinyl group has shown high efficiency for controlling the stereoselectivity in the reactions of the benzylic anion derived from 2-*p*-tolylsulfinyl ethylbenzene **1** with different electrophiles.¹ In this communication we describe the stereochemical behavior of benzylic anion under deuteration conditions, as well as the synthesis of the two possible monodeuterated diastereoisomers.



Sulfoxide **1** was deprotonated with lithium diisopropylamide (LDA) and reacted with CH₃OD to afford **3a** as the only monodeuterated isomer. Monoprotonation of compound **2** under similar conditions produces isomer **3b** instead. Monoprotonation of **3a** exclusively yields **3b** and monodeuteration of **3b** only affords **3a**. In contrast, reaction of **3a** with

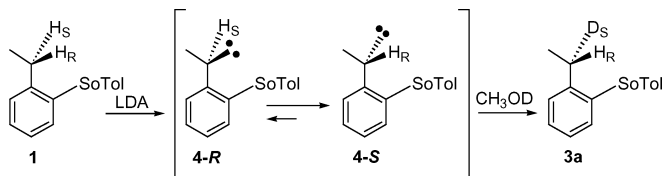
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LDA and CH_3OD gives **2** whereas **3b** yields **1** upon reaction with LDA and CH_3OH .

The deprotonation is highly diastereoselective but the resulting carbanions are configurationally unstable and they invert their configuration immediately before reacting with the electrophile.



This inversion was demonstrated by Sn-Li exchange experiments because of the transmetallation and deuteration (or protonation) processes with retention of configuration.²

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