

**First substoichiometric version of the catalytic enantioselective addition of an  
alkyllithium to an aldehyde.**

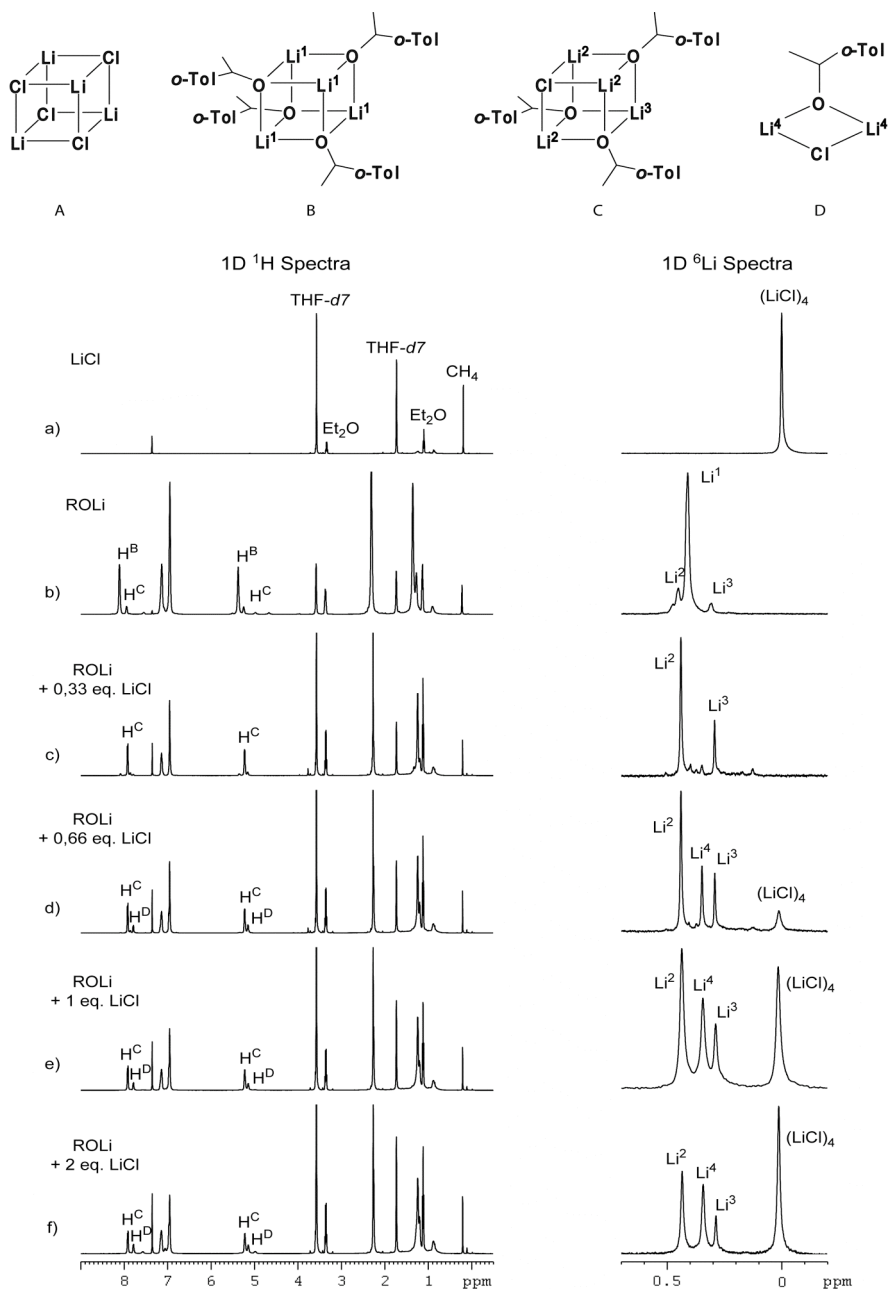
Baptiste Lecache, Catherine Fressigné, Hassan Oulyadi,  
Anne Harrison-Marchand, Jacques Maddaluno

**Supplementary Information**

**Typical procedure of the catalytic substoichiometric enantioselective nucleophilic 1,2-  
addition of methyllithium onto *ortho*-tolualdehyde.**

Methyllithium (0.30 mmol, 1.2 equiv., 1.6 M in diethylether) was added to a solution of 3APH (0.25 mmol, 0.33 equiv.) in THF (15 mL) at -20°C under an atmosphere of argon. After stirring for 20 min., a second aliquot of MeLi (0.90 mmol, 1.2 equiv. 1.6 M in diethylether) was added dropwise to the preformed solution of lithium amide (3APLi). The resulting mixture was stirred for 30 min. at -20°C. The mixture was cooled to -78°C and let for 30 min. at this temperature. A solution of *o*-tolualdehyde (0.75 mmol, 1 equiv.) and LiCl (0.33 equiv., 0.3 M in THF) in THF (4 mL) was added at -78°C over a 1h period and the mixture was stirred at -78°C for another hour. The medium was then quenched at the same temperature with a 3 M aqueous HCl solution (3 mL) and was extracted with diethylether (3 x 10 mL) at room temperature. The combined organic layers were washed with aqueous NaHCO<sub>3</sub> (sat., 10 mL) then brine (10 mL), dried with MgSO<sub>4</sub> and concentrated under reduced pressure. The residue was purified by column chromatography (Et<sub>2</sub>O / cyclohexane, 3:7) to give 1-*o*-tolylethanol in 80% yield. The analytical data are in full agreement with data in literature: Li, W.; Sun, X.; Zhou, L.; Hou, G.; Yu, S.; Zhang, X. *J. Org. Chem.* **2009**, *74*, 1397-1399.

### NMR spectra of *o*-TolCH(CH<sub>3</sub>)OLi / LiCl mixed aggregate



Addition of lithium chloride on the lithium (*R*)-1-*o*-tolylethanolate. Enlargement of 1D <sup>1</sup>H and 1D <sup>6</sup>Li spectra recorded in THF at 195K. a) <sup>6</sup>LiCl polluted by solvents. b) lithium (*R*)-1-*o*-tolylethanolate. c) Addition of 0.33 eq. of <sup>6</sup>LiCl. d) Addition of 0.66 eq. of <sup>6</sup>LiCl. e) Addition of 1 eq. of <sup>6</sup>LiCl. f) Addition of 2 eq. of <sup>6</sup>LiCl.