# Exercises Session (26/01/17)

## Give the mechanism of the various reactions depicted below

#### Exercise 1

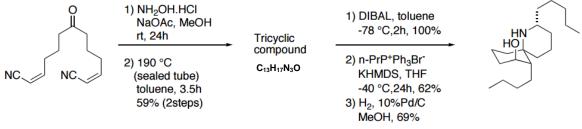
$$\begin{array}{c} \text{(1S)-(-)-$\beta$-pinene} \\ \text{Hg(NO}_3)_2, \text{CH}_2\text{Cl}_2 \\ -40 \, ^{\circ}\text{C to rt}; & \text{conc. HCl} \\ \hline \\ \text{NaBH}_4, \text{NaOH} & \text{reflux} \\ \text{MeOH} \\ 0 \, ^{\circ}\text{C to rt} & 59\% \\ \hline \\ 39\% \\ \end{array}$$

C. H. Heathcock et al., J. Org. Chem., 58, 564 (1993)

#### Exercise 2

L. Barriault et al., Org. Lett., 7, 5921 (2005)

#### Exercise 3



Robert A. S. et al., J. Org. Chem., 69, 1598 (2004)

## Exercise 4

# Exercise 5