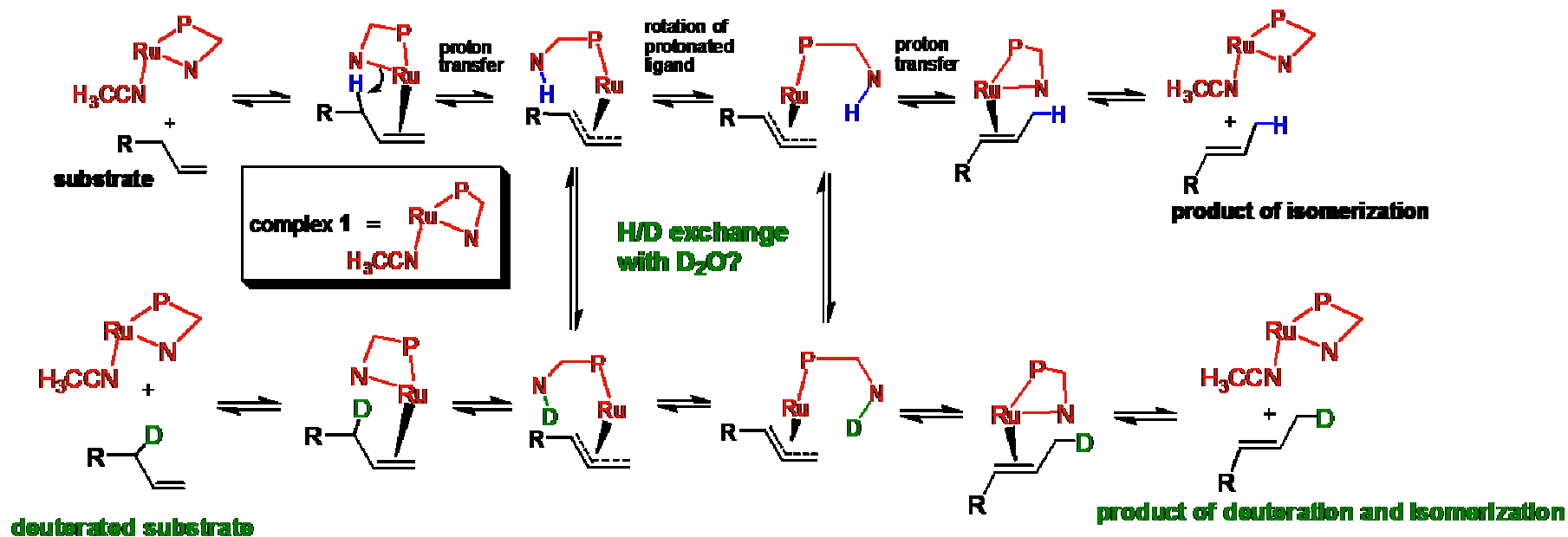
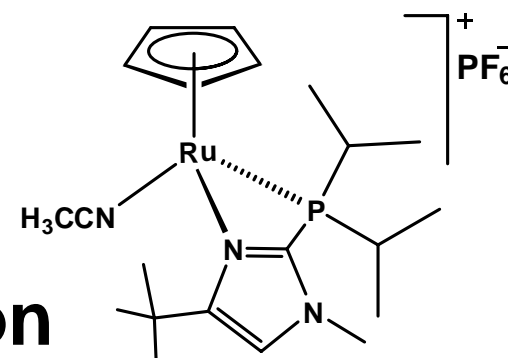
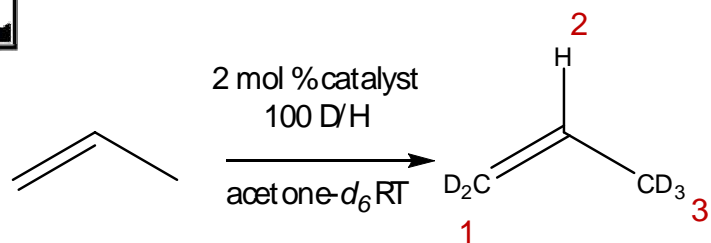




Bifunctional Catalysis Of Alkene Isomerization / Deuteration

Gulin Erdogan, Douglas B. Grotjahn*

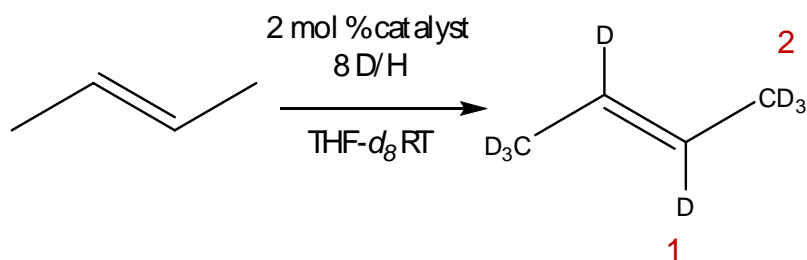




Full retention of H at C-2

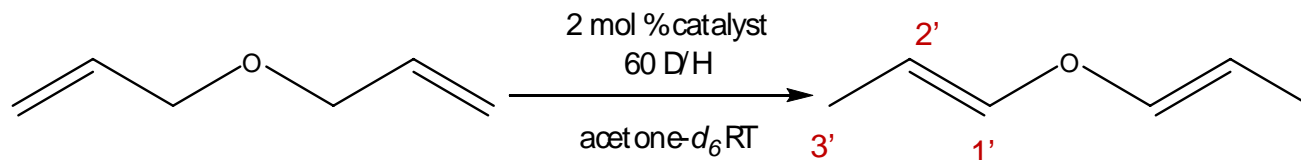
Time(h)	1	2	3
1	35.6	96.8	18.4
2	21.7	102.7	12.5
5	13.8	99.8	9.8
24	11.8	99.9	9.3

Table 1 % Hydrogen left on indicated positions of 1-propene after specified times at RT



Time (h)	1	2
1	55.7	33.9
24	7.8	8.42

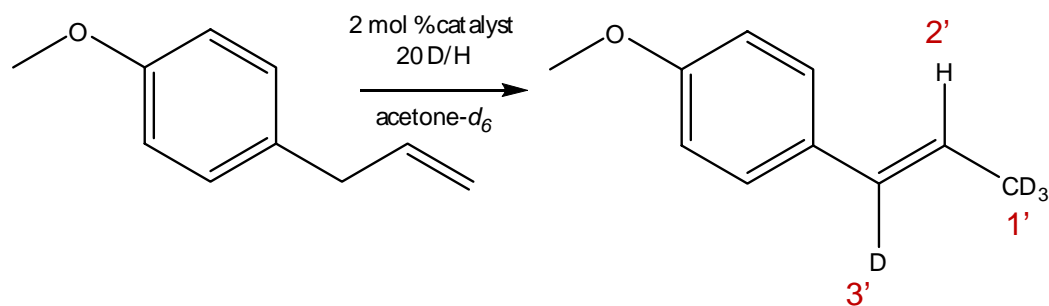
Table 2 % Hydrogen left on indicated positions of trans-2-butene after specified times at RT



Only (E,E) isomer

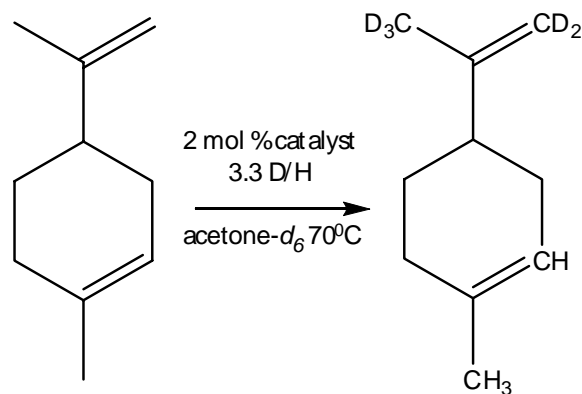
No detectable hydrolysis of (E,E)-di-propenyl ether

Time(h)	1'	2'	3'
1	69.8	93.0	60.0
24	46.0	94.0	24.7
120	28.1	91.5	6.56



condition	Time (h)	3'	2'	1'
RT	24	31.3	99.1	4.7
RT	72	5.7	98.7	3.5
70°C	5	5.4	98.6	16.3
70°C	24	9.0	103	5.1

Table 4 % Hydrogen left on indicated positions of trans-anethole after specified times and conditions



Time (h)	Endocyclic vinyl	Isopropenyl vinyl	Isopropenyl methyl
24	102	76.0	63.6
96	101	36.5	40.0

Table 5 % Hydrogen left on indicated positions of (+)-Limonene after specified times

- Hydrogen deuterium exchange can efficiently be achieved with deuterium oxide as the deuterium source
- Catalysis in heterogeneous media is as efficient as catalysis in homogeneous media

Acknowledgements

- Grotjahn Group
- Casey Larsen
- Dr. LeRoy Lafferty
- NSF CHE 0415783
- NSF CHE 0719575