

Supporting Information for

**"Deuterium NMR Spectroscopy is a Versatile and
Economical Tool for Monitoring Reaction Kinetics
in Ionic Liquids"**

Armando Durazo and Mahdi M. Abu-Omar*

Chemical Communications

(7 pages total)

Table of Contents

Fig.	Reaction	Solvent
S1	[D8] Styrene dihydroxylation, [H ₂ O ₂] = 5.0 M	[EtPy] BF ₄
S2	[D8] Styrene epoxidation (UHP)	[Emim] BF ₄
S3	[D10] Cyclohexene epoxidation (UHP)	[Emim] BF ₄
S4	[D10] Cyclohexene dihydroxylation aq H ₂ O ₂	[Emim] BF ₄
S5	[D6] DMSO oxidation, aq H ₂ O ₂	[Emim] BF ₄
S6	[D6] Me ₂ S methylation	[Emim] BF ₄

All reactions are conducted at 298 K.

All figures include a) NMR stack plot and b)
kinetic trace.

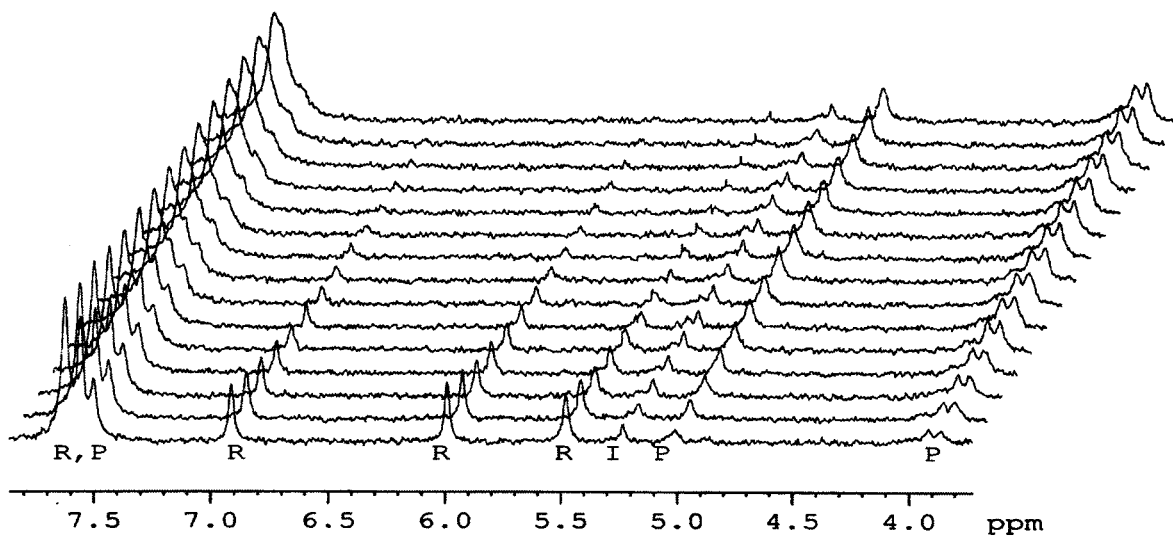
For more complicated spectra, individual
resonances are labeled as belonging to :

R = reactant

I = intermediate

P = product

a)



b)

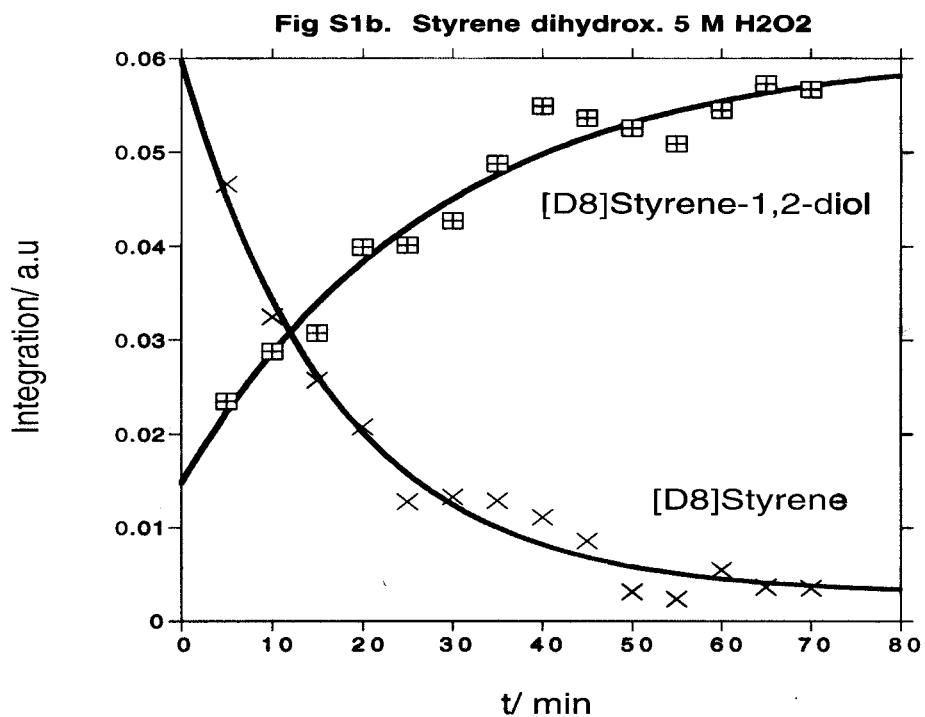
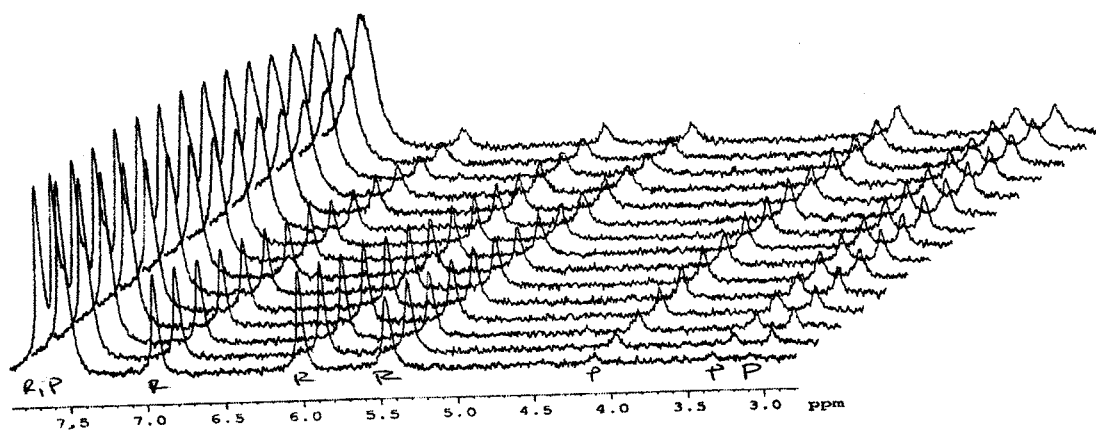


Figure S1. Dihydroxylation of [D8] Styrene. Conditions: [H₂O₂] = 5.0 M, [styrene-d₈] = 0.030 M, [MTO] = 0.0050 M at T = 298 K. 5 min. intervals.

a)



b)

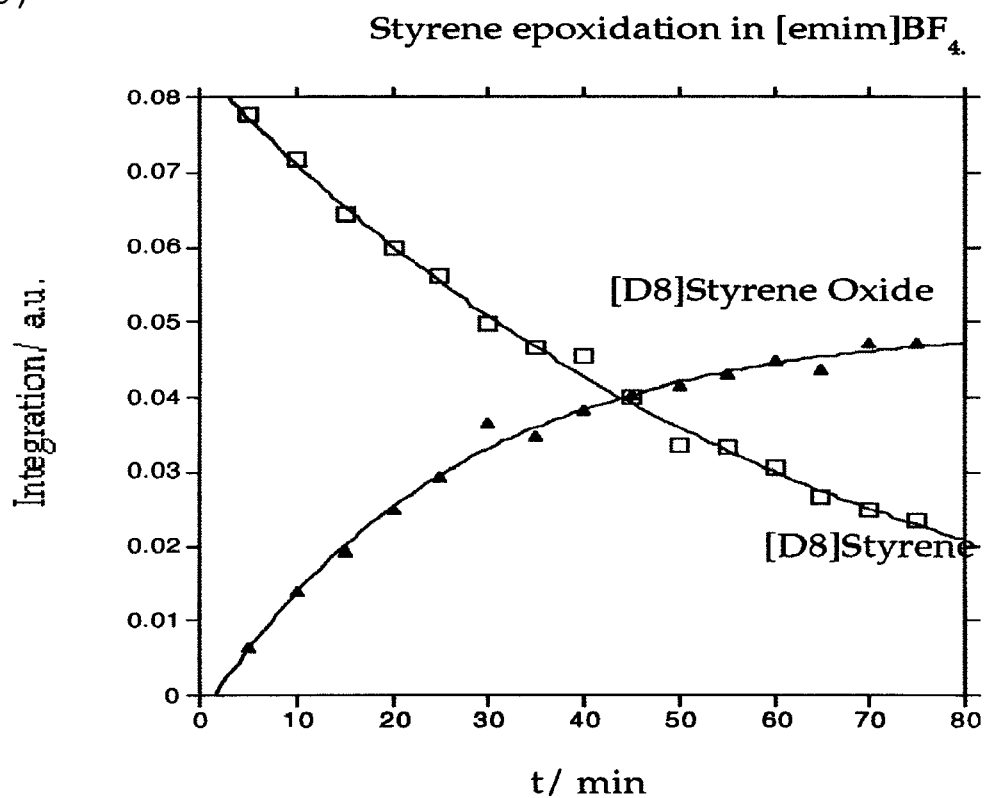
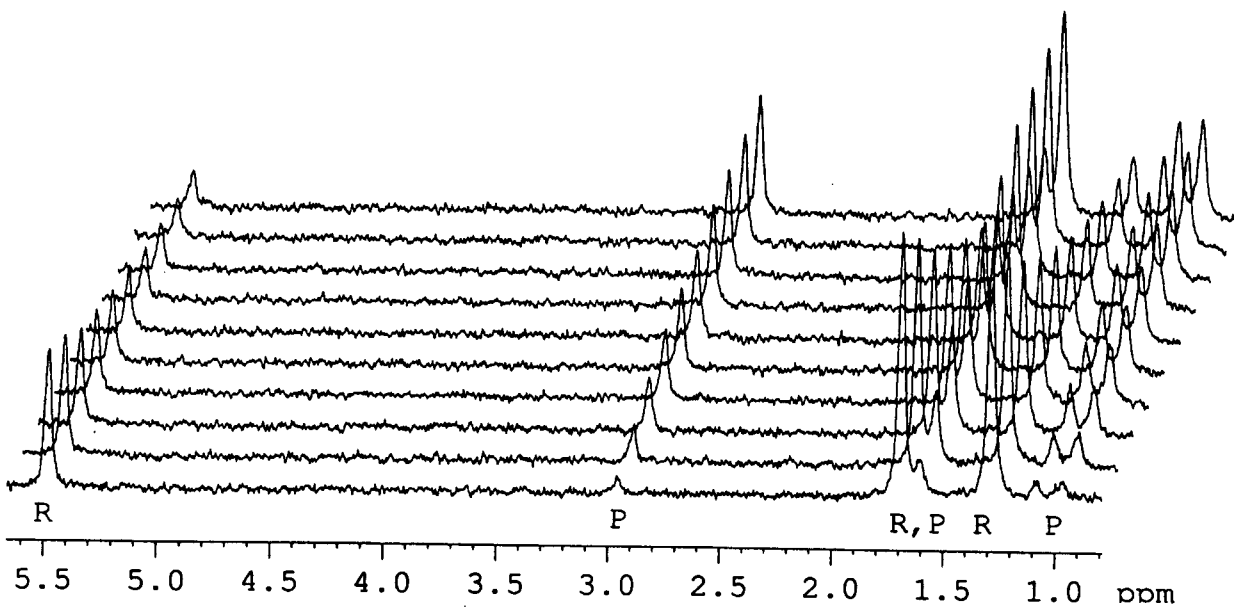


Figure S2. Exoxidation of [D8] Styrene. Conditions: $[\text{UHP}] = 1.0 \text{ M}$, $[\text{MTO}] = 0.008 \text{ M}$, $[\text{styrene-d8}] = 0.10 \text{ M}$ in $[\text{Emim}]\text{BF}_4$ at $T = 298 \text{ K}$. 5 min intervals.

a)



b)

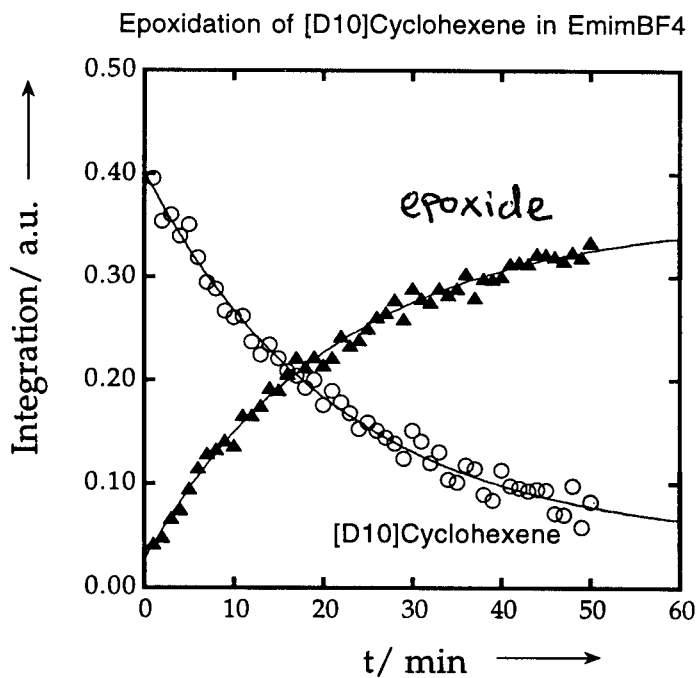
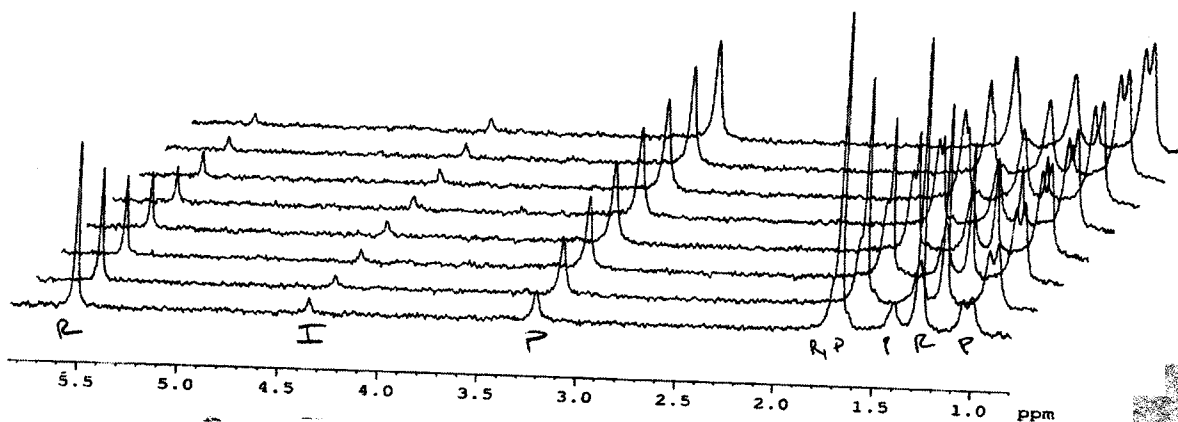


Fig S3. Epoxidation of [D10]Cyclohexene in [Emim]BF₄, 4 mM MTO, 100 mM cyclohexene, 1 M UHP 298 K.

a)



b)

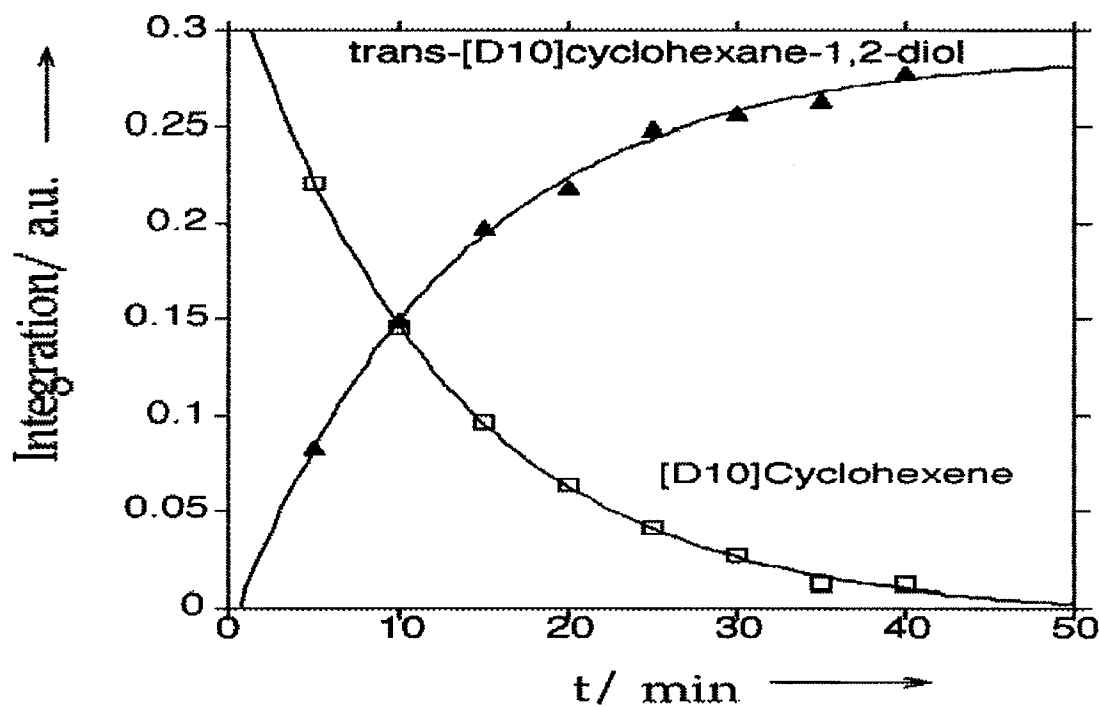
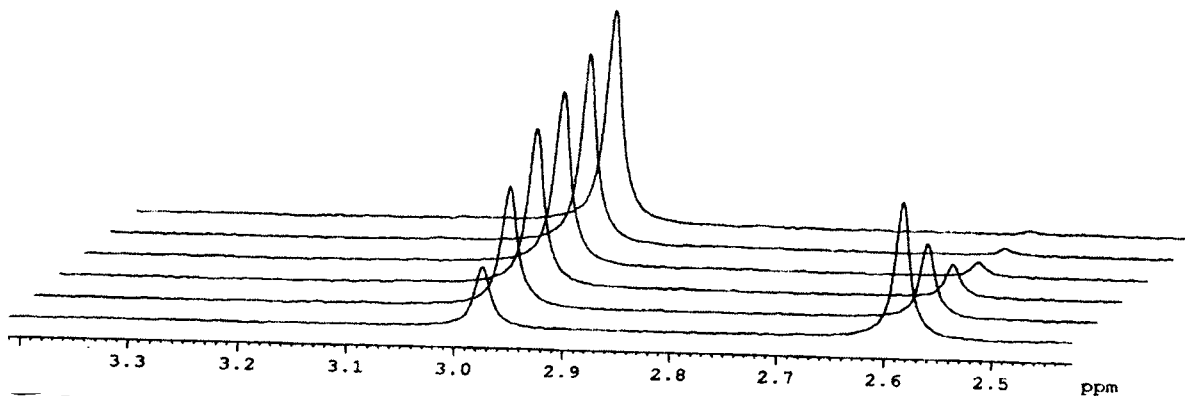


Figure S4. Dihydroxylation of $[\text{D}_{10}]$ Cyclohexene. Conditions: $[\text{H}_2\text{O}_2] = 0.50 \text{ M}$, $[\text{MTO}] = 8.0 \times 10^{-4} \text{ M}$, and $[\text{cyclohexene-d}_{10}] = 0.10 \text{ M}$ at $T = 298\text{K}$. 5 min intervals.

a) spectra shown at 5 minute intervals.



b)

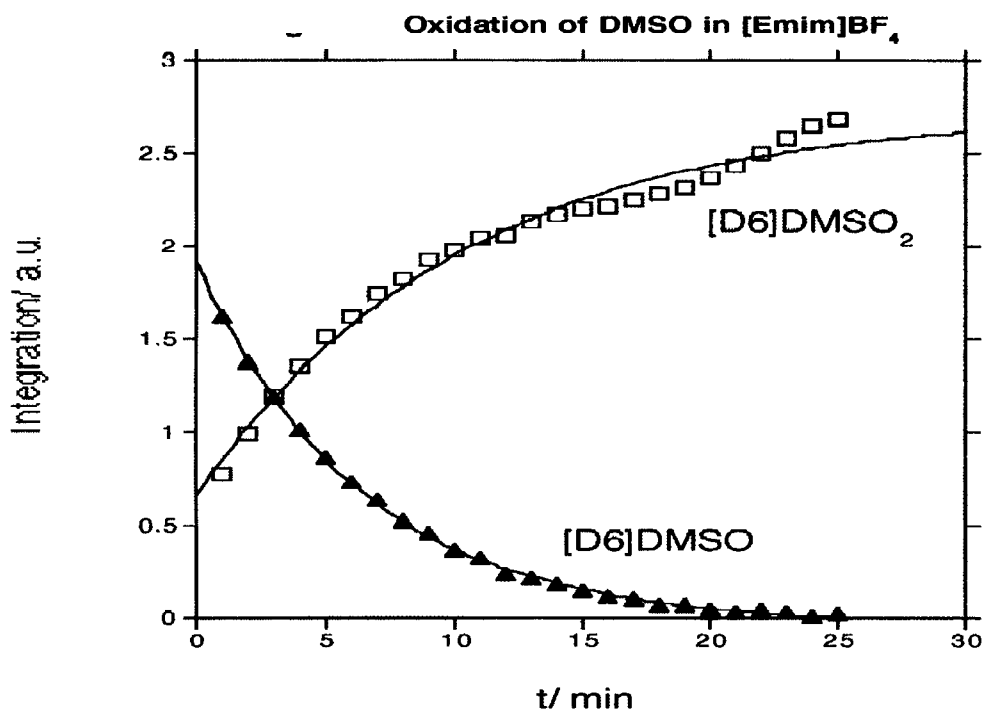
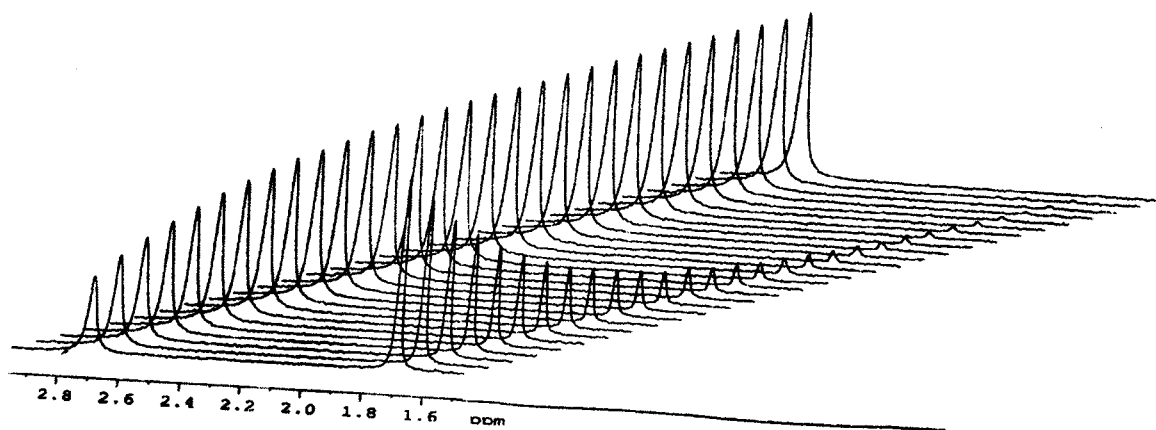


Figure S5. Oxidation of [D6] DMSO in [emim] BF₄.
Conditions: [H₂O₂] = 1.4 M, [MTO] = 1.0 × 10⁻³ M, [DMSO-d6] = 0.142 M at 298K.

a)



b)

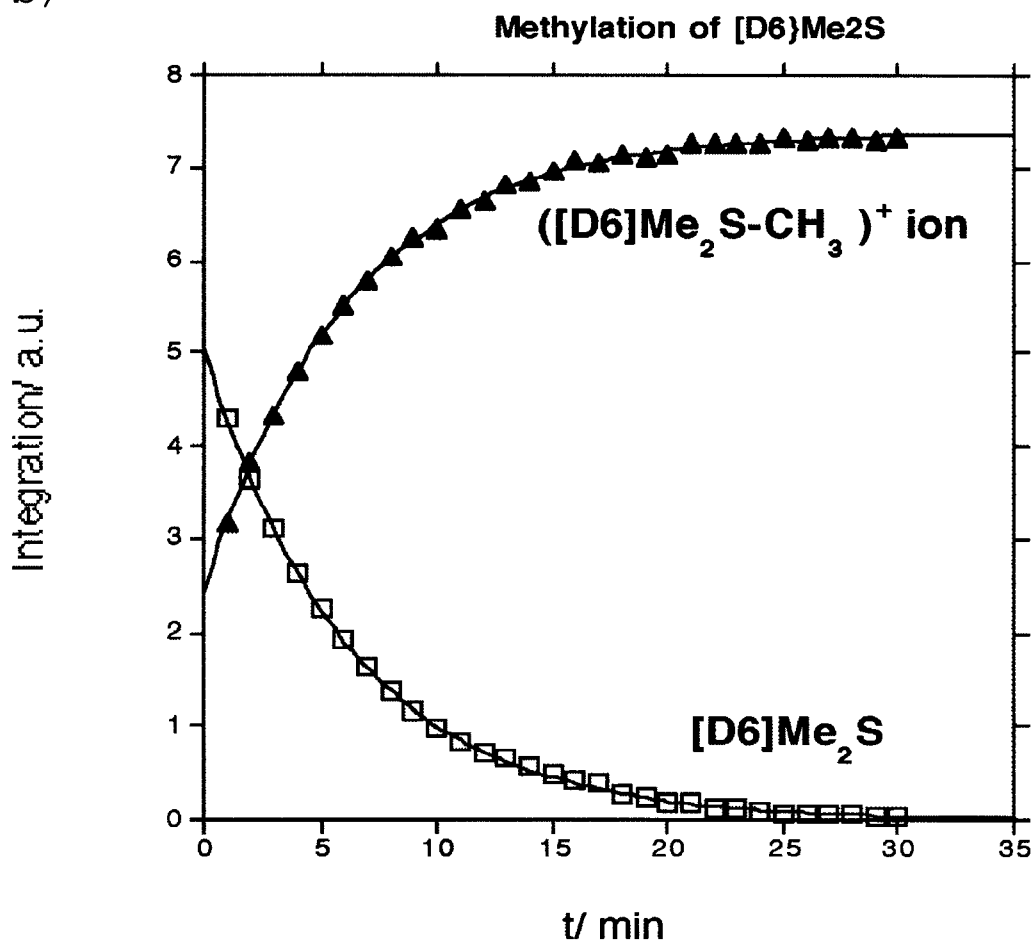


Fig S6. Methylation of [D6]Me₂S in [Emim]BF₄.
 Conditions: [CH₃I] = 1.0 M and [d₆-Me₂S] = 0.10 M at T = 298 K.