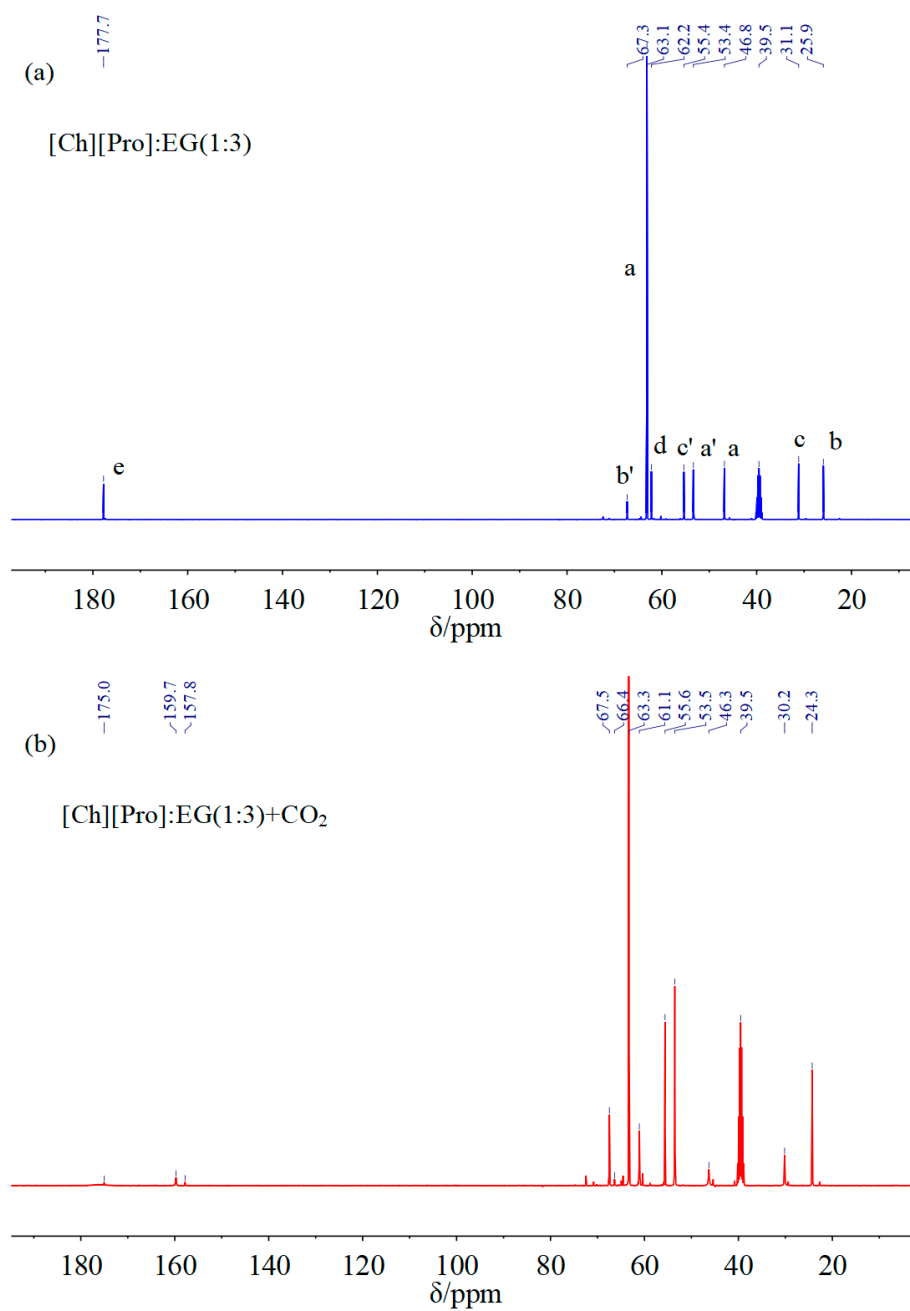# CO₂ Capture Mechanism by Deep Eutectic Solvents Formed by Choline Prolinate and Ethylene Glycol
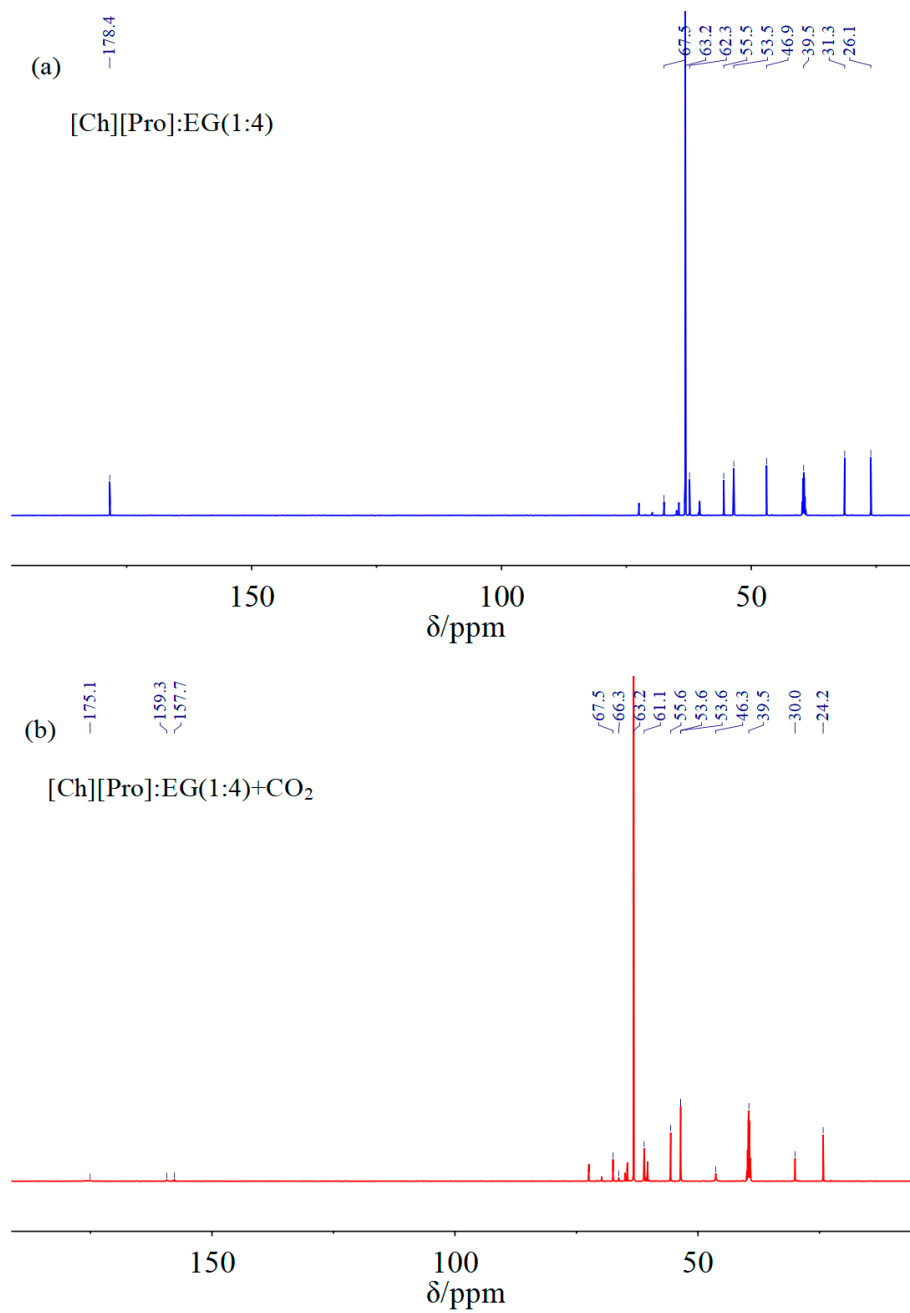
Mingzhe Chen and Jinming Xu *

School of Science, China University of Geosciences, Beijing 100083, China;
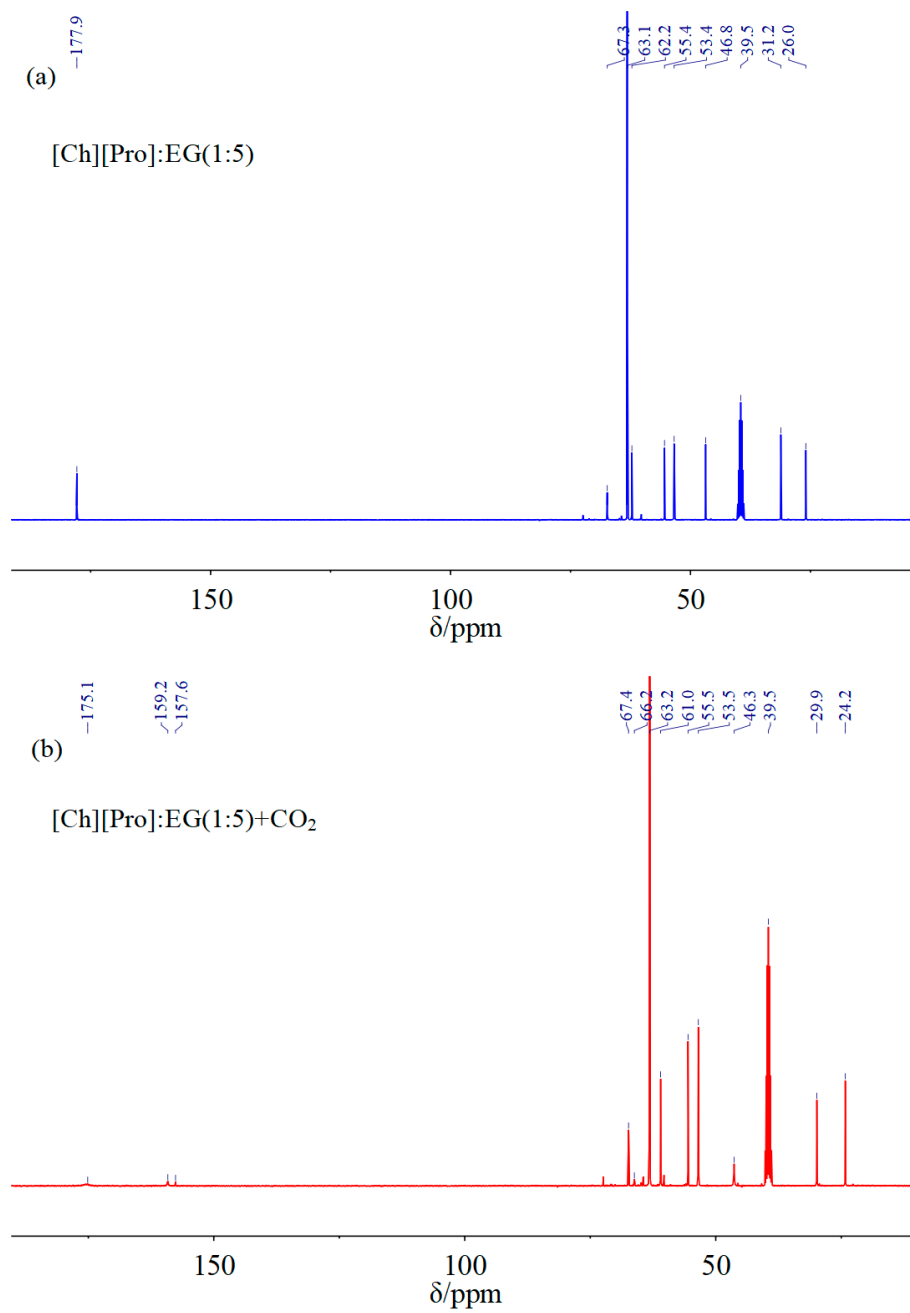2019220039@email.cugb.edu.cn

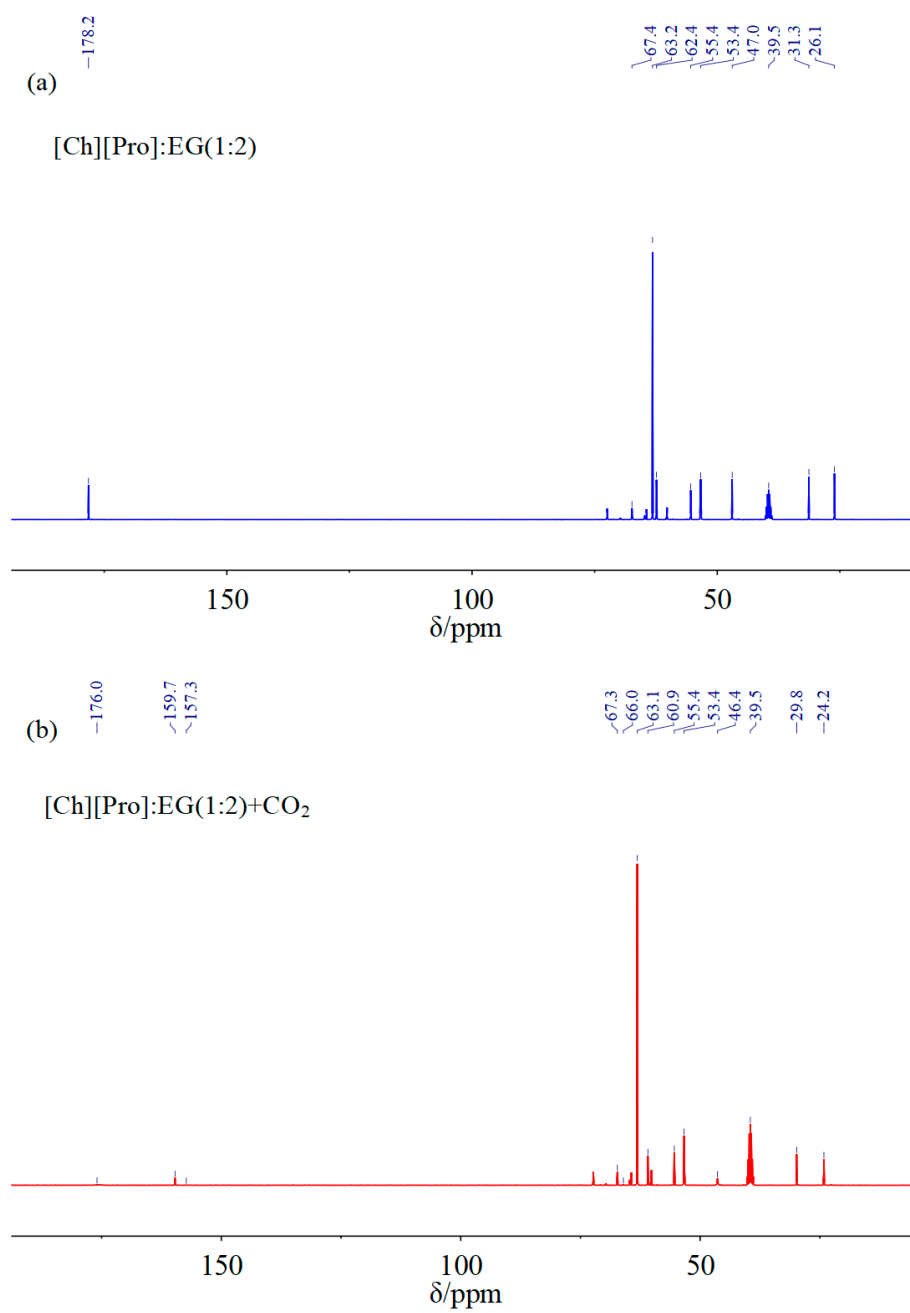*   Correspondence: xujm@cugb.edu.cn

(a) [Ch][Pro]:EG(1:3)

-177.7

67.3
63.1
62.2
55.4
53.4
46.8
39.5
31.1
25.9

e, b', d, c', a', a, c, b

(b) [Ch][Pro]:EG(1:3)+CO$_2$

-175.0
-159.7
-157.8

67.5
66.4
63.3
61.1
55.6
53.5
46.3
39.5
30.2
24.3

δ/ppm

Figures S1. The ^{13}C NMR spectra of [Ch][Pro]:EG (1:3) before (a) and after (b) CO$_2$ capture.

(a)

−178.4

67.5
63.2
62.3
55.5
53.5
46.9
39.5
31.3
26.1

[Ch][Pro]:EG(1:4)

150   100   50

δ/ppm

(b)

−175.1

159.3
157.7

67.5
66.3
63.2
61.1
55.6
53.6
53.6
46.3
39.5
30.0
24.2

[Ch][Pro]:EG(1:4)+CO$_2$

150   100   50

δ/ppm

Figures S2. The ^{13}C NMR spectra of [Ch][Pro]:EG (1:4) before (a) and after (b) CO$_2$ capture.

(a) [Ch][Pro]:EG(1:5)

−177.9

67.3
63.1
62.2
55.4
53.4
46.8
39.5
31.2
26.0

150 100 50
δ/ppm

(b) [Ch][Pro]:EG(1:5)+CO$_2$

−175.1

159.2
157.6

67.4
66.2
63.2
61.0
55.5
53.5
46.3
39.5

29.9
24.2

150 100 50
δ/ppm

Figures S3. The ^{13}C NMR spectra of [Ch][Pro]:EG (1:5) before (a) and after (b) CO$_2$ capture.

(a)

[Ch][Pro]:EG(1:2)

−178.2

67.4
63.2
62.4
55.4
53.4
47.0
39.5
31.3
26.1

150   100   50
δ/ppm

(b)

[Ch][Pro]:EG(1:2)+CO$_2$

−176.0
159.7
157.3

67.3
66.0
63.1
60.9
55.4
53.4
46.4
39.5
29.8
24.2

150   100   50
δ/ppm

Figures S4. The ^{13}C NMR spectra of [Ch][Pro]:EG (1:2) before (a) and after (b) CO$_2$ capture.

(a)

−178.1

63.2
62.4
51.7
51.6
51.6
47.0
39.5
31.3
26.1

−7.1

[Et₄N][Pro]:EG(1:3)

150   100   50   0
δ/ppm

(b)

−175.5

−159.5
−157.4

66.0
63.2
61.1
60.8
51.7
46.6
39.5

−29.6
−24.1

7.2

[Et₄N][Pro]:EG(1:3)+CO₂

150   100   50
δ/ppm
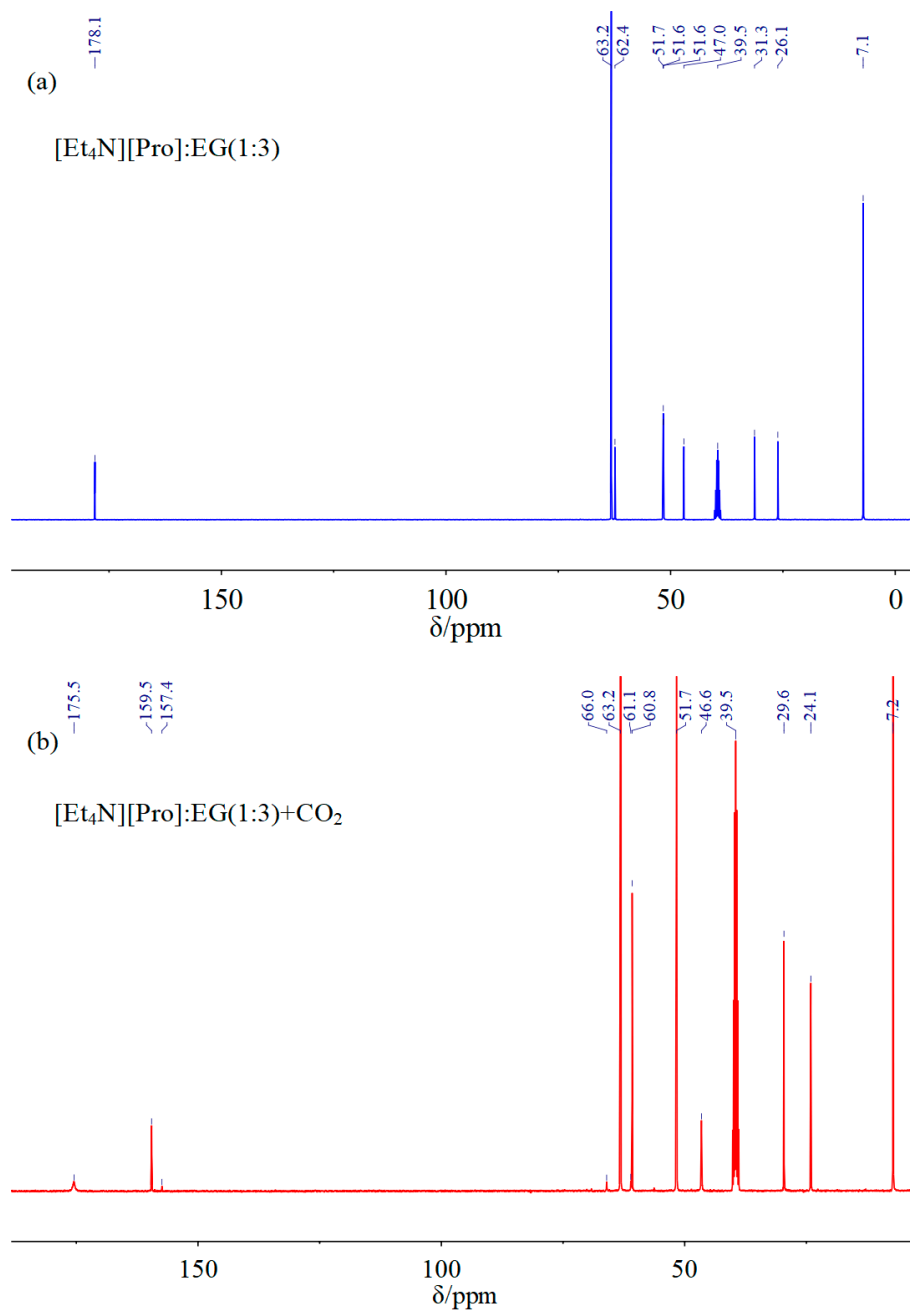
Figures S5. The ^{13}C NMR spectra of [Et₄N][Pro]:EG (1:3) before (a) and after (b) CO_2 capture.
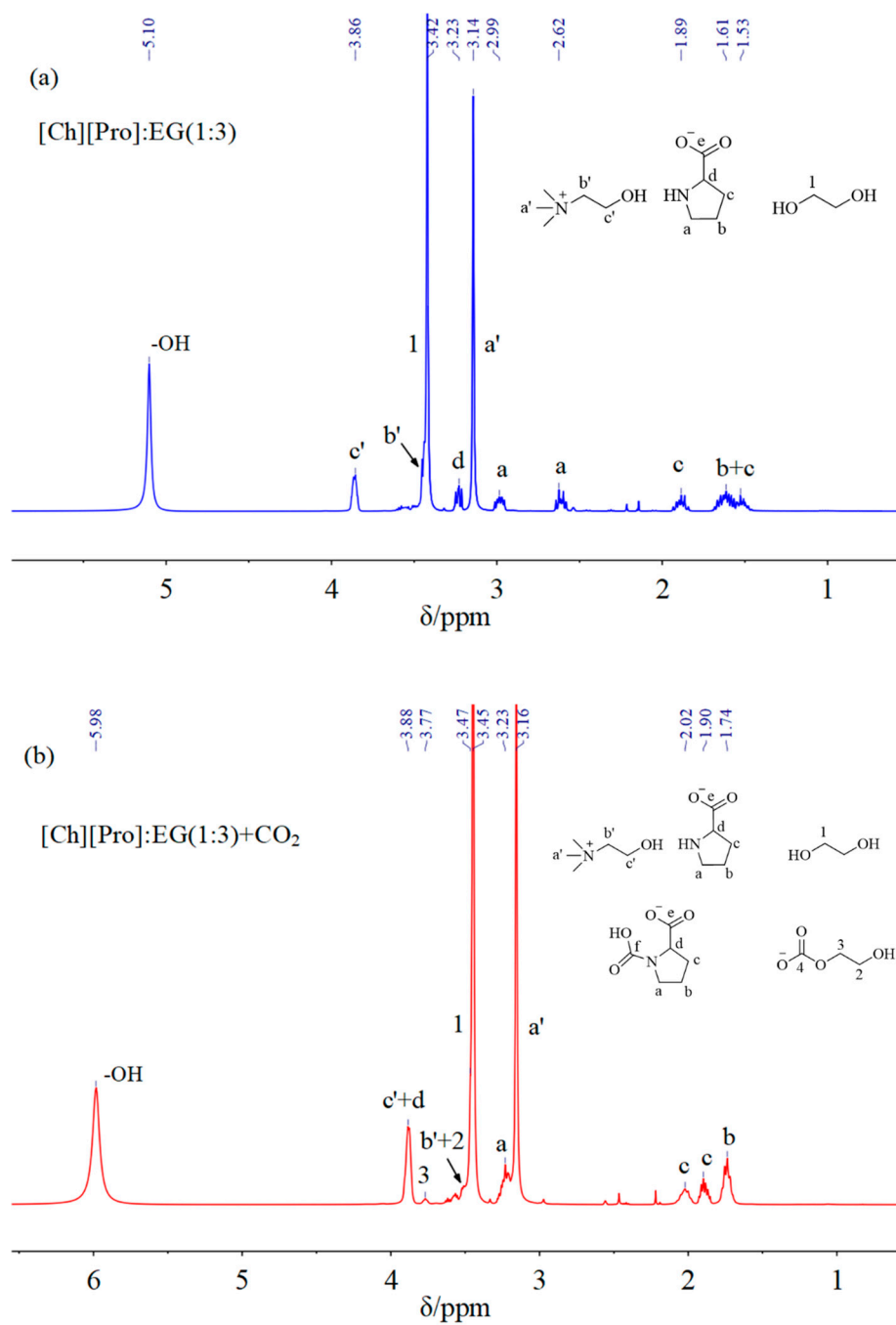
Figures S6. The ^1H NMR spectra of [Ch][Pro]:EG (1:3) before (a) and after (b) CO_2 capture.
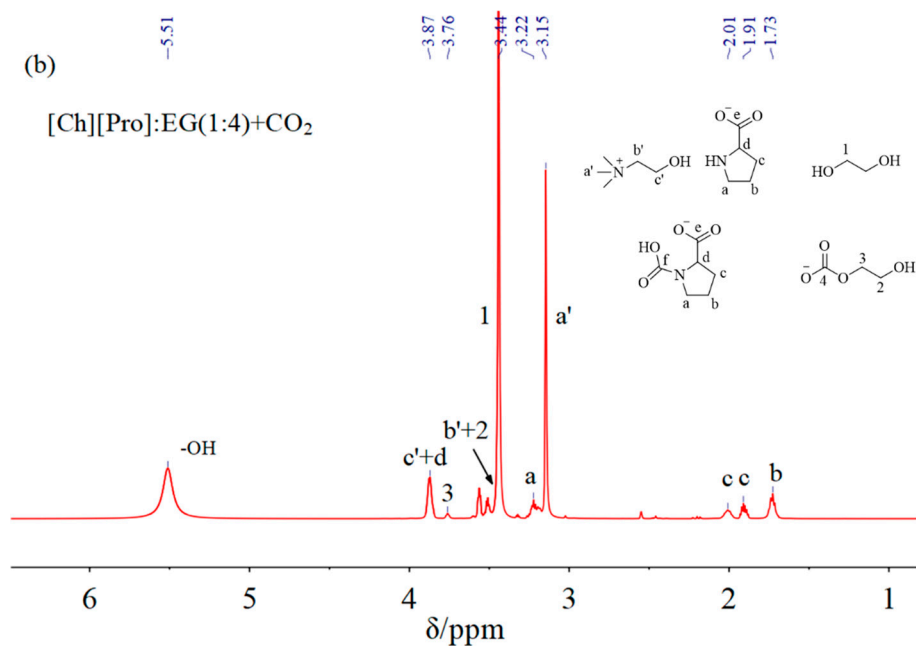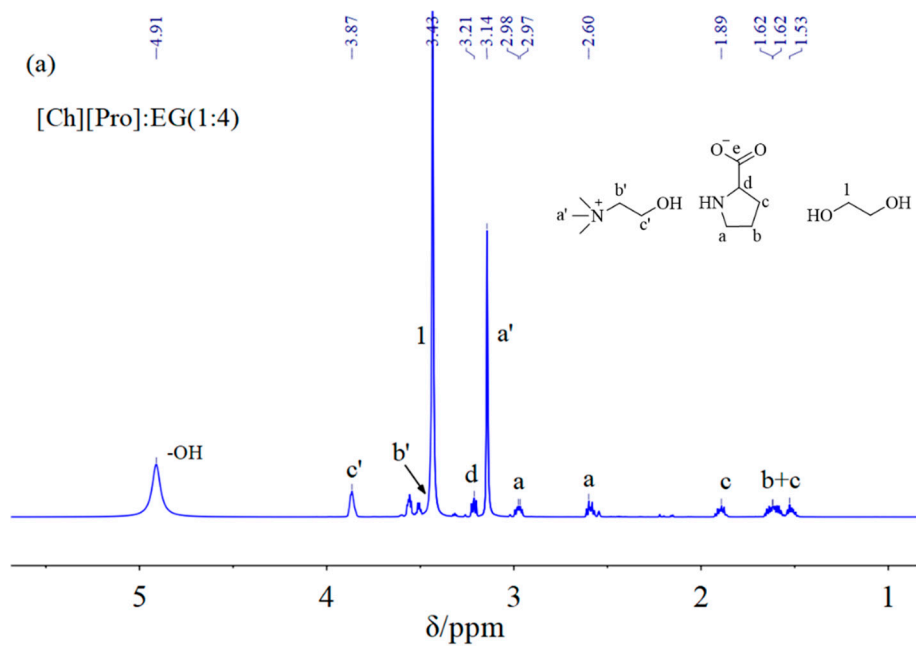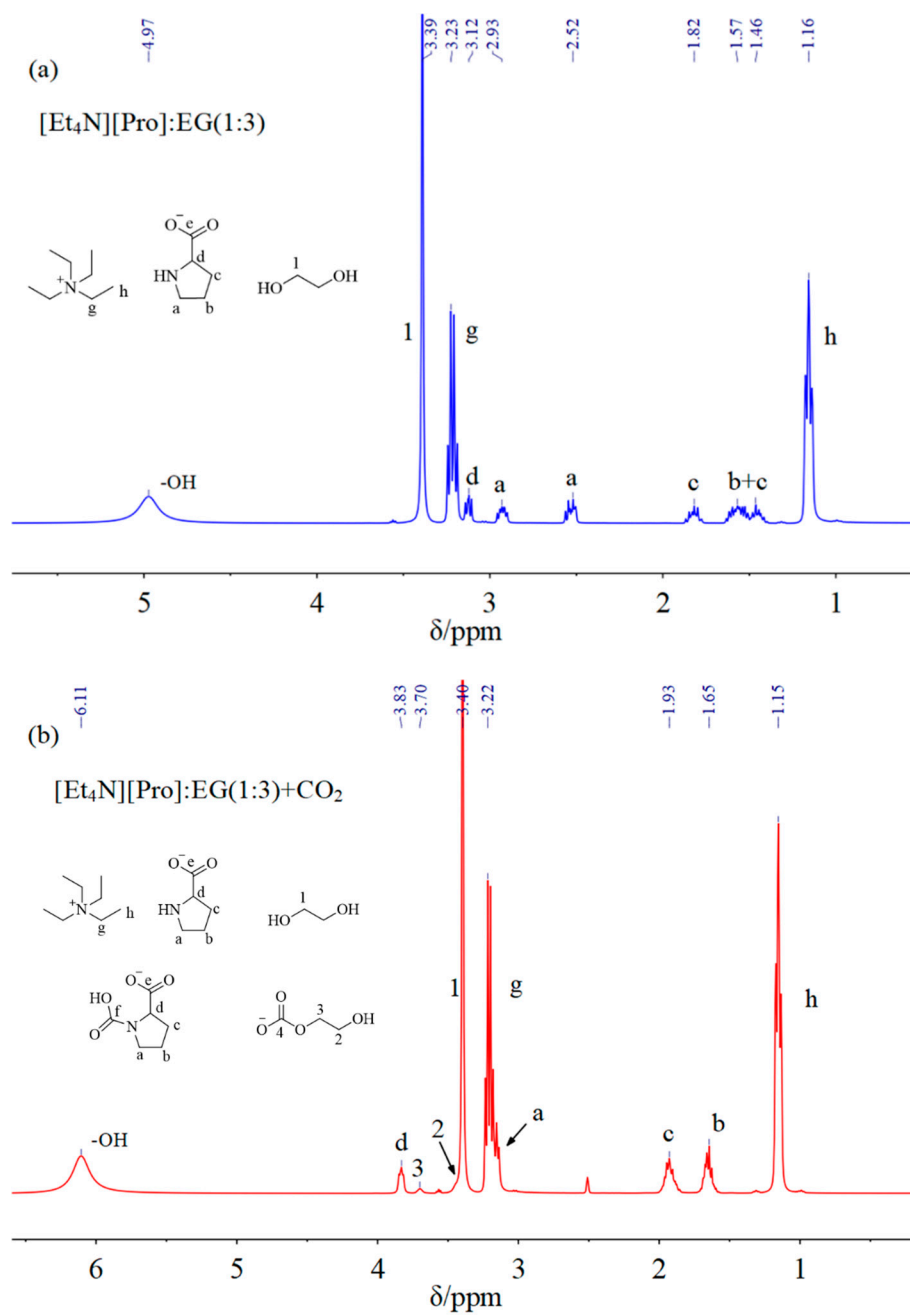
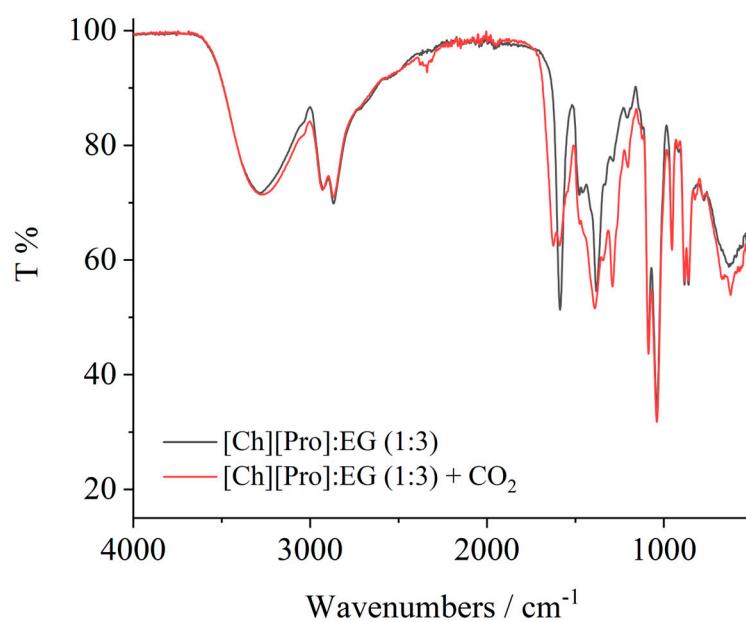**Figures S7**. The ^{1}H NMR spectra of [Ch][Pro]:EG (1:4) before (a) and after (b) CO_2 capture.
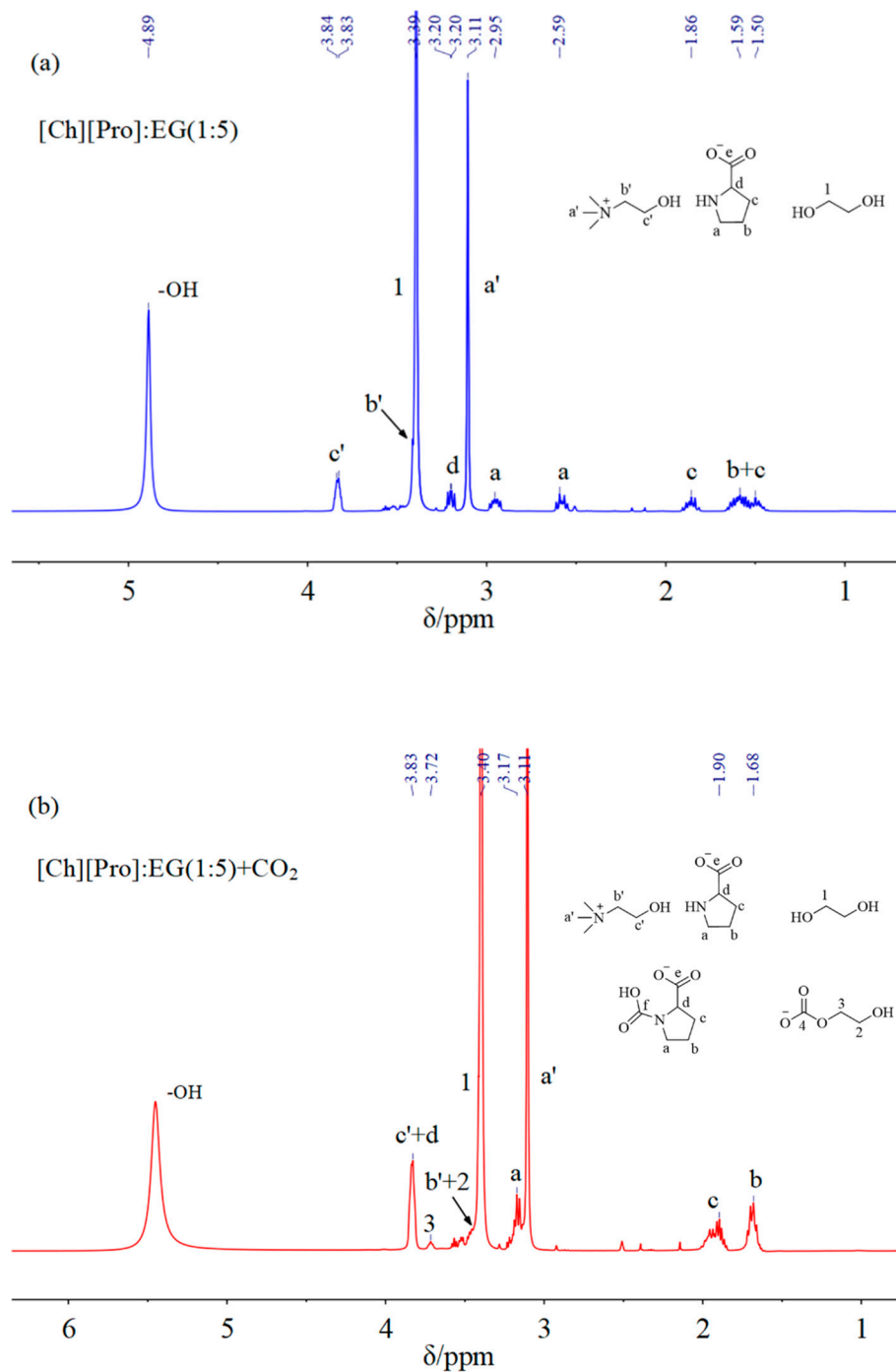
Figures S8. The ^1H NMR spectra of [Ch][Pro]:EG (1:5) before (a) and after (b) CO_2 capture.
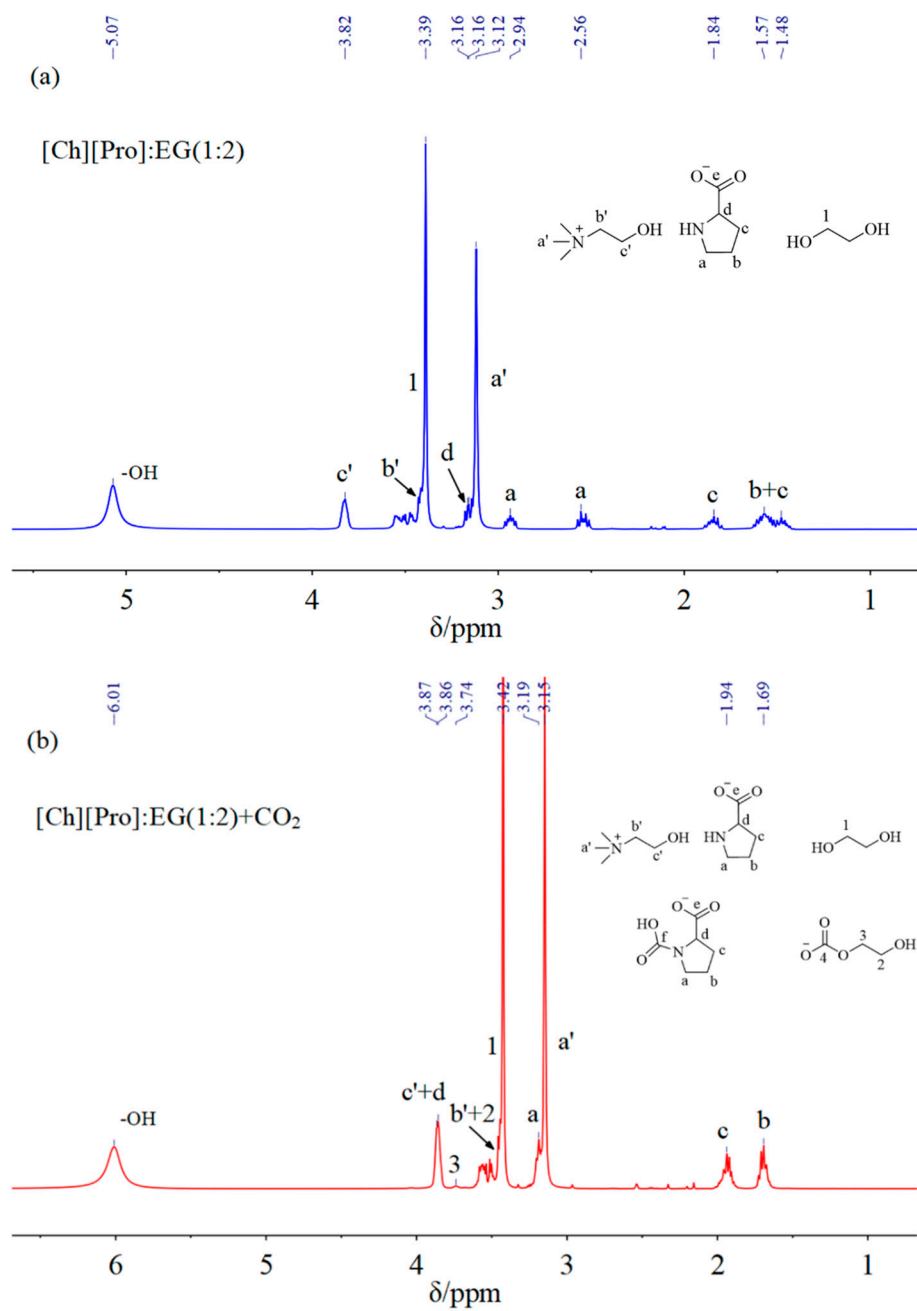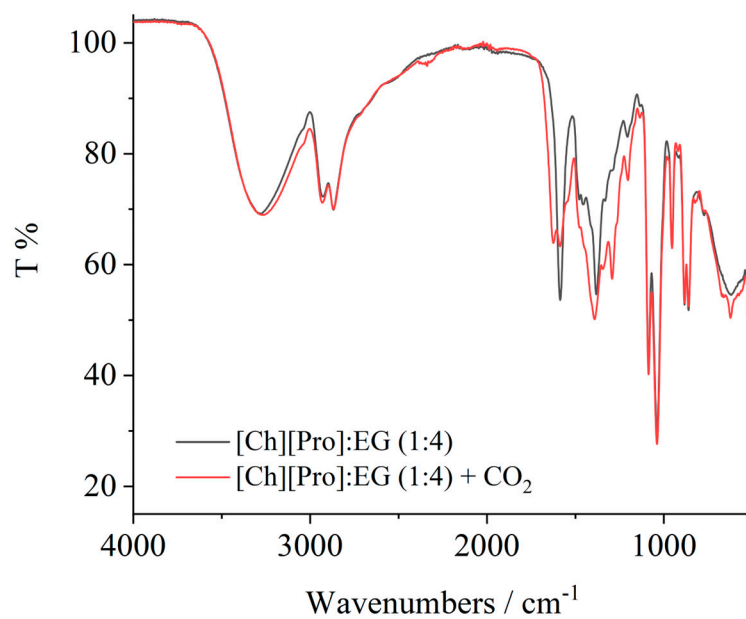
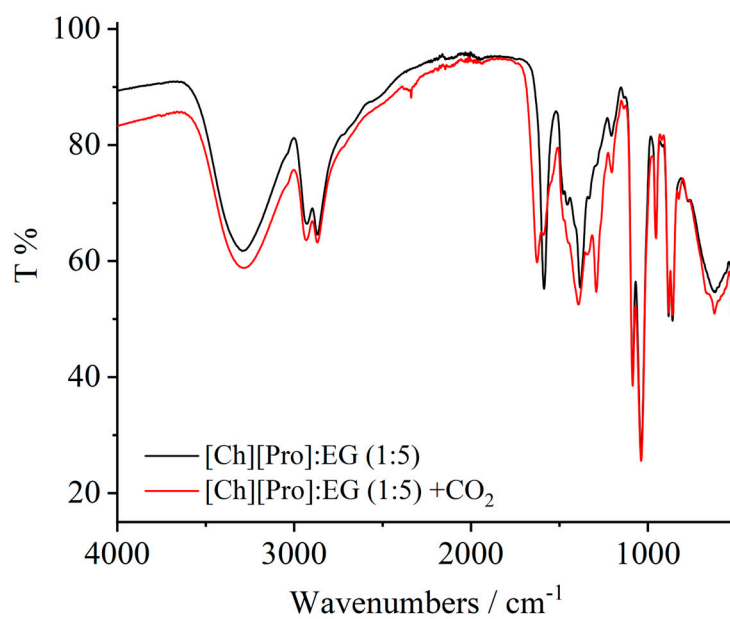**Figures S9**. The ^{1}H NMR spectra of [Ch][Pro]:EG (1:2) before (a) and after (b) CO_2 capture.

Figures S10. The ^1H NMR spectra of [Et$_4$N][Pro]:EG (1:3) before (a) and after (b) CO_2 capture.
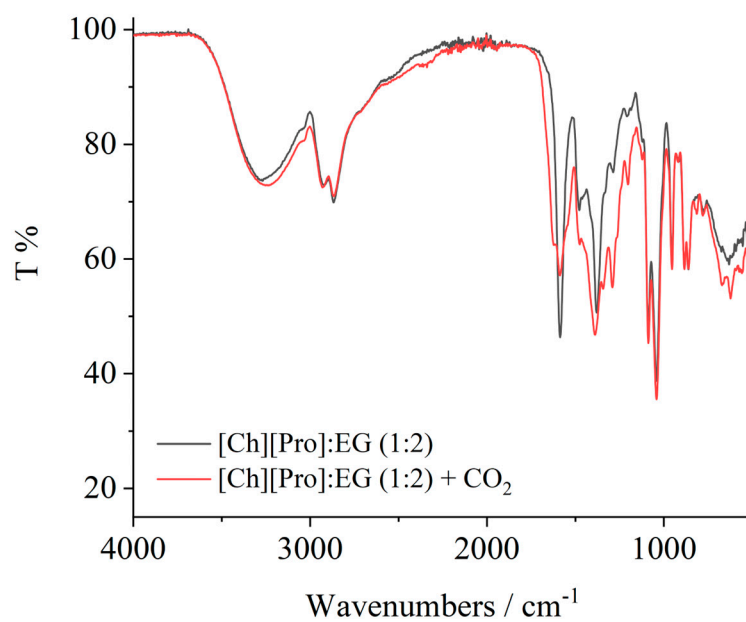
Figures S11. The FTIR spectra of [Ch][Pro]:EG (1:3) before and after CO_2 capture.
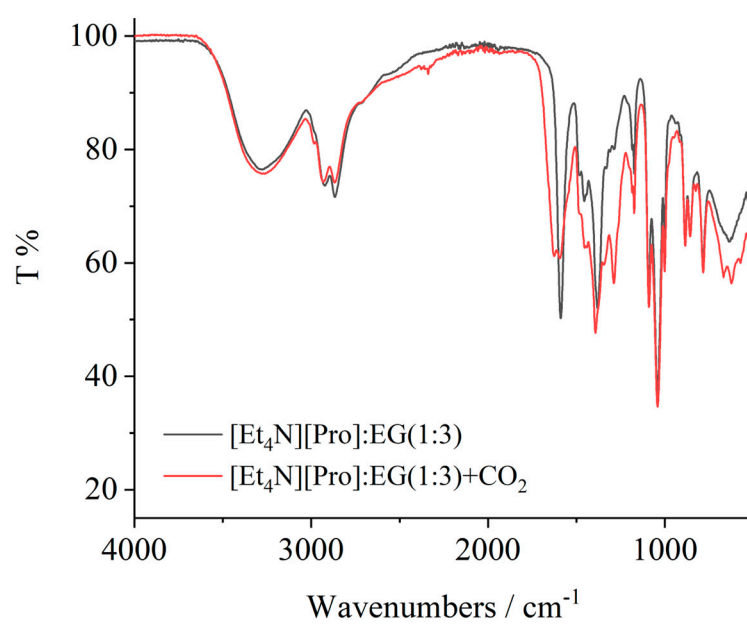

Figures S12. The FTIR spectra of [Ch][Pro]:EG (1:4) before and after CO_2 capture.

Figures S13. The FTIR spectra of [Ch][Pro]:EG (1:5) before and after CO_2 capture.

Figures S14. The FTIR spectra of [Ch][Pro]:EG (1:2) before and after CO_2 capture.

Figures S15. The FTIR spectra of [Et$_4$N][Pro]:EG (1:3) before and after CO$_2$ capture.