Supplementary Material.

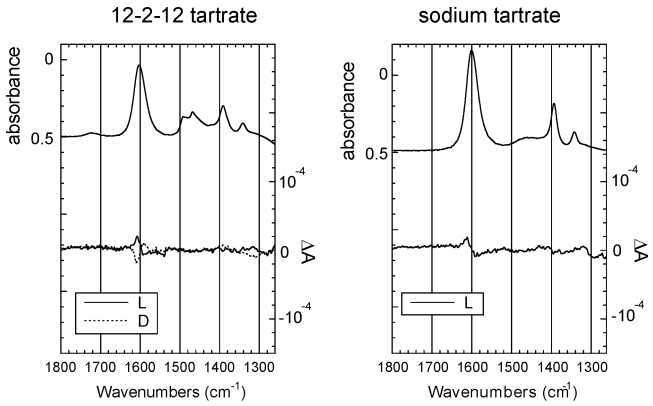

Figure SM 1. Infrared absorption and circular dichroism spectra of 12-2-12 L and D-tartrate, and of sodium L-tartrate in the carbonyl stretching region recorded at 100 mM in D_2O at room temperature with a sample path length of 50 m.

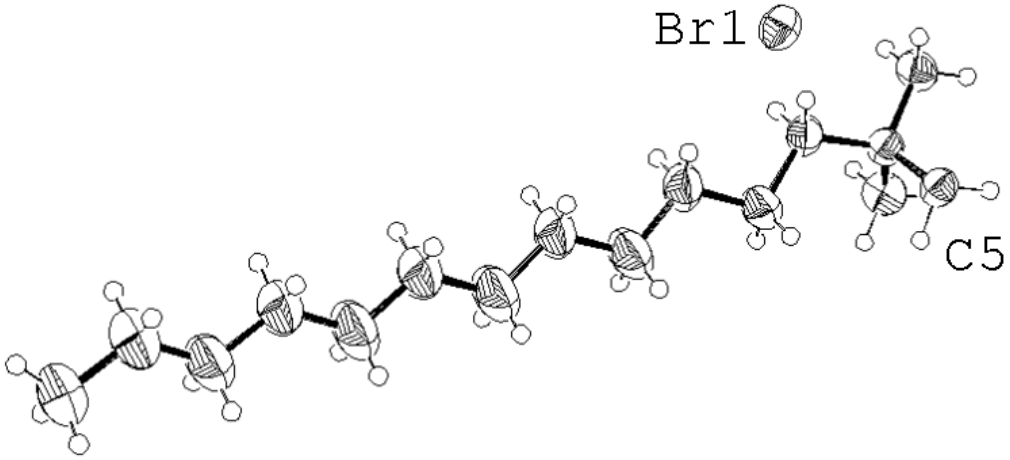

Figure SM 2. Ortep view of the asymmetric unit (50 % probability ellipsoids) of the crystal structure of C_2H_4-1,2-($Br^-Me_2N^+C_{12}H_{25}$)$_2$ showing a half molecule. The two halves are connected through carbon C5.

Table SM 1. Crystal data and structure refinement for C_2H_4-1,2-($Br^-Me_2N^+C_{12}H_{25}$)$_2$

Empirical formula	$C_{15}H_{33}BrN$
Formula weight	307.33 $g.mol^{-1}$
Temperature	296(2) K
Wavelength	1.54178 Å

Crystal system	triclinic
Space group	*P 1*
Unit cell dimensions	a = 6.971(3) Å = 80.810(10) deg.
	b = 8.667(2) Å = 88.21(2) deg.
	c = 15.737(2) Å = 66.44(2) deg.
Volume	859.8(4) $Å^3$
Z	2
Density (calculated)	1.187 Mg/m^3
Absorption coefficient	3.104 mm^{-1}
F(000)	330
Crystal size	0.30 x 0.30 x 0.20 mm
Color of crystal	colorless
range for data collection	2.85 to 65.40 deg.
Index ranges	-7<=h<=7, 0<=k<=10, -17<=l<=18
Reflections collected	2870
Independent reflections	2863 [R(int) = 0.0392]
Intensity measurement method	/2 scan
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	2862 / 0 / 154
Goodness-of-fit on F^2	1.034
Final R indices [I>2 (I)]	R1 = 0.0471, wR2 = 0.1384
R indices (all data)	R1 = 0.0503, wR2 = 0.1442
Largest diff. peak and hole	0.645 and -0.596 e.$Å^{-3}$

Table SM2. Atomic coordinates (x 10^4) and equivalent isotropic displacement parameters ($Å^2$ x 10^3) for C_2H_4-1,2-($Br^-Me_2N^+C_{12}H_{25}$)$_2$.[a]

	x	y	z	U(eq)
Br(1)	3859(1)	7794(1)	3986(1)	66(1)
N(2)	666(4)	13006(3)	4456(2)	45(1)
C(3)	1526(6)	11612(4)	5218(2)	54(1)

C(4)	-782(6)	12555(4)	3949(2)	59(1)
C(5)	-640(5)	14682(4)	4750(2)	47(1)
C(6)	2492(5)	13049(4)	3918(2)	50(1)
C(7)	1943(6)	14379(5)	3113(2)	64(1)
C(8)	3889(6)	14347(5)	2682(3)	67(1)
C(9)	3633(8)	15581(7)	1867(3)	83(1)
C(10)	5555(7)	15697(6)	1513(3)	80(1)
C(11)	5518(9)	16784(9)	700(3)	102(2)
C(12)	7395(8)	16958(6)	382(3)	85(1)
C(13)	7507(10)	17992(9)	-428(3)	109(2)
C(14)	9389(8)	18215(6)	-686(3)	87(1)
C(15)	9631(9)	19220(9)	-1476(3)	101(2)
C(16)	11474(10)	19482(8)	-1686(4)	103(2)
C(17)	11732(10)	20498(8)	-2469(4)	104(2)

[a] U(eq) is defined as one third of the trace of the orthogonalized Uij tensor.

Table SM3. Bond lengths [Å] and angles [deg] for C_2H_4-1,2-($Br^-Me_2N^+C_{12}H_{25}$)$_2$.[a]

N(2)-C(3)	1.504(4)
N(2)-C(4)	1.508(4)
N(2)-C(5)	1.512(4)
N(2)-C(6)	1.516(4)
C(5)-C(5)#1	1.514(6)
C(6)-C(7)	1.515(4)
C(7)-C(8)	1.490(5)
C(8)-C(9)	1.497(5)
C(9)-C(10)	1.469(6)
C(10)-C(11)	1.457(6)
C(11)-C(12)	1.441(7)
C(12)-C(13)	1.456(6)
C(13)-C(14)	1.438(7)

C(14)-C(15)	1.446(6)
C(15)-C(16)	1.412(8)
C(16)-C(17)	1.447(6)
C(3)-N(2)-C(4)	107.2(2)
C(3)-N(2)-C(5)	110.5(2)
C(4)-N(2)-C(5)	107.0(2)
C(3)-N(2)-C(6)	107.9(2)
C(4)-N(2)-C(6)	110.3(2)
C(5)-N(2)-C(6)	113.7(2)
N(2)-C(5)-C(5)#1	112.7(3)
C(7)-C(6)-N(2)	116.0(3)
C(8)-C(7)-C(6)	110.1(3)
C(7)-C(8)-C(9)	117.2(4)
C(10)-C(9)-C(8)	116.5(4)
C(11)-C(10)-C(9)	121.6(4)
C(12)-C(11)-C(10)	121.0(5)
C(11)-C(12)-C(13)	124.6(5)
C(14)-C(13)-C(12)	122.3(5)
C(13)-C(14)-C(15)	125.8(5)
C(16)-C(15)-C(14)	124.1(5)
C(15)-C(16)-C(17)	124.7(6)

[a] Symmetry transformations used to generate equivalent atoms:

#1 -x,-y+3,-z+1

Table SM4. Anisotropic displacement parameters ($Å^2$ x 10^3) for C_2H_4-1,2-($Br^-Me_2N^+C_{12}H_{25}$)$_2$.[a]

	U11	U22	U33	U23	U13	U12
Br(1)	57(1)	72(1)	75(1)	-18(1)	6(1)	-29(1)
N(2)	45(1)	41(1)	48(1)	-5(1)	4(1)	-19(1)
C(3)	64(2)	42(2)	54(2)	3(1)	5(2)	-23(1)

C(4)	64(2)	58(2)	62(2)	-10(2)	-1(2)	-32(2)
C(5)	43(2)	42(1)	53(2)	-7(1)	5(1)	-16(1)
C(6)	50(2)	45(2)	51(2)	-7(1)	11(1)	-17(1)
C(7)	64(2)	72(2)	53(2)	4(2)	5(2)	-30(2)
C(8)	70(2)	57(2)	67(2)	-4(2)	22(2)	-22(2)
C(9)	89(3)	101(3)	60(2)	10(2)	7(2)	-48(3)
C(10)	76(3)	74(3)	77(3)	5(2)	23(2)	-26(2)
C(11)	94(4)	137(5)	75(3)	22(3)	9(2)	-62(3)
C(12)	83(3)	80(3)	80(3)	8(2)	21(2)	-31(2)
C(13)	100(4)	150(5)	78(3)	26(3)	11(3)	-69(4)
C(14)	84(3)	84(3)	83(3)	7(2)	21(2)	-33(2)
C(15)	92(4)	133(5)	76(3)	26(3)	4(2)	-58(3)
C(16)	102(4)	108(4)	88(3)	15(3)	21(3)	-43(3)
C(17)	106(4)	115(4)	87(3)	15(3)	21(3)	-52(3)

[a] The anisotropic displacement factor exponent takes the form:

$-2\ ^{2}\ [\ h^{2}\ a^{*2}\ U11 + ... + 2\ h\ k\ a^{*}\ b^{*}\ U12\ ]$

Table SM5. Hydrogen coordinates (x 10^{4}) and isotropic displacement parameters ($Å^{2}$ x 10^{3}) for C_2H_4-1,2-($Br^{-}Me_2N^{+}C_{12}H_{25}$)$_2$.

	x	y	z	U(eq)
H(3A)	2458(6)	11858(4)	5557(2)	81
H(3B)	2274(6)	10544(4)	5021(2)	81
H(3C)	393(6)	11544(4)	5564(2)	81
H(4A)	-1363(6)	13421(4)	3456(2)	88
H(4B)	-1893(6)	12478(4)	4306(2)	88
H(4C)	-13(6)	11478(4)	3764(2)	88
H(5A)	-1733(5)	14544(4)	5111(2)	56
H(5B)	-1310(5)	15531(4)	4251(2)	56
H(6A)	3454(5)	13240(4)	4278(2)	60
H(6B)	3227(5)	11935(4)	3751(2)	60

H(7A)	1076(6)	14152(5)	2721(2)	77
H(7B)	1154(6)	15500(5)	3263(2)	77
H(8A)	4670(6)	13206(5)	2555(3)	80
H(8B)	4738(6)	14556(5)	3089(3)	80
H(9A)	2960(8)	15271(7)	1432(3)	100
H(9B)	2690(8)	16706(7)	1972(3)	100
H(10A)	6173(7)	16054(6)	1947(3)	95
H(10B)	6517(7)	14548(6)	1454(3)	95
H(11A)	4981(9)	16383(9)	259(3)	122
H(11B)	4496(9)	17920(9)	745(3)	122
H(12A)	8416(8)	15811(6)	357(3)	101
H(12B)	7909(8)	17367(6)	827(3)	101
H(13A)	7112(10)	17528(9)	-883(3)	131
H(13B)	6422(10)	19123(9)	-427(3)	131
H(14A)	10461(8)	17076(6)	-680(3)	104
H(14B)	9775(8)	18664(6)	-223(3)	104
H(15A)	9340(9)	18727(9)	-1943(3)	122
H(15B)	8511(9)	20344(9)	-1503(3)	122
H(16A)	12588(10)	18356(8)	-1665(4)	124
H(16B)	11773(10)	19959(8)	-1214(4)	124
H(17A)	13113(10)	20489(8)	-2465(4)	156
H(17B)	10712(10)	21649(8)	-2504(4)	156
H(17C)	11543(10)	20030(8)	-2957(4)	156

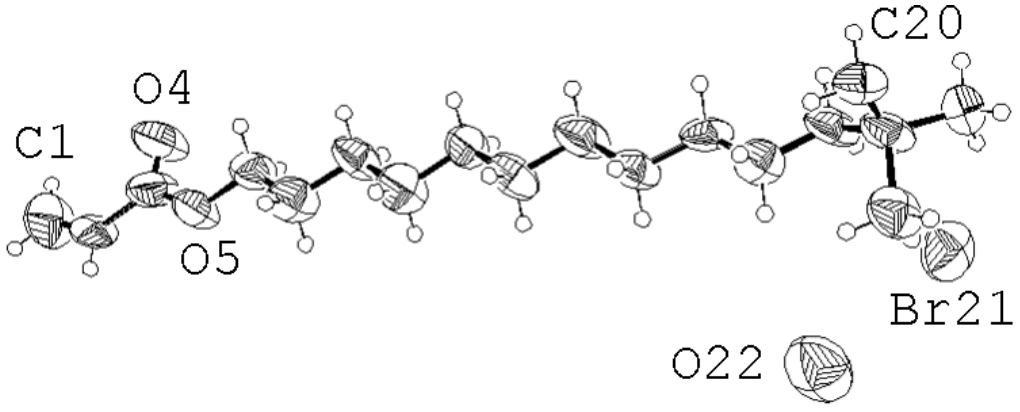

Figure SM 3. Ortep view of the asymmetric unit (50 % probability ellipsoids) of the crystal structure of C_2H_4-1,2-($Br^-Me_2N^+C_{11}H_{22}OCOCHCH_2)_2(H_2O)_2$ showing half a molecule. The two halves are connected through carbon C20.

Table SM6. Crystal data and structure refinement for C_2H_4-1,2-($Br^-Me_2N^+C_{11}H_{22}OCOCHCH_2)_2$.

Empirical formula	C17 H37 Br N2 O3
Formula weight	397.40
Temperature	296(2) K
Wavelength	1.54180 A
Crystal system, space group	triclinic, P -1
Unit cell dimensions	a = 8.241(1) A alpha = 74.42(1) deg.
	b = 9.356(1) A beta = 85.33(1) deg.
	c = 14.281(1) A gamma = 71.04(1) deg.
Volume	1003.11(18) A^3
Z, Calculated density	2, 1.316 Mg/m^3
Absorption coefficient	2.852 mm^-1
F(000)	404
Crystal size	0.30 x 0.12 x 0.06 mm
Color of crystal	colorless
Theta range for data collection	5.17 to 45.65 deg.
Limiting indices	-7<=h<=7, -8<=k<=8, 0<=l<=13
Reflections collected / unique	1614 / 1614 [R(int) = 0.0000]
Max. and min. transmission	0.8475 and 0.4816
Intensity measurement method	theta/2theta scan
Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	1614 / 0 / 200
Goodness-of-fit on F^2	1.036
Final R indices [I>2sigma(I)]	R1 = 0.1121, wR2 = 0.2584
R indices (all data)	R1 = 0.2056, wR2 = 0.3217

Extinction coefficient 0.0000(11)

Largest diff. peak and hole 0.871 and -0.425 e.A^-3

Table SM7. Atomic coordinates (x 10^4) and equivalent isotropic

displacement parameters (A^2 x 10^3) for ih129a.

U(eq) is defined as one third of the trace of the orthogonalized

Uij tensor.

	x	y	z	U(eq)
C(1)	7510(30)	5450(20)	2002(16)	131(9)
C(2)	8410(20)	4816(17)	1395(14)	80(5)
C(3)	9440(30)	3130(20)	1596(18)	104(7)
O(4)	9470(20)	2222(15)	2369(12)	128(6)
O(5)	10309(15)	2677(11)	833(8)	90(4)
C(6)	11290(20)	1077(17)	942(13)	89(6)
C(7)	12020(20)	846(19)	-1(11)	98(6)
C(8)	13070(20)	-892(16)	59(11)	88(6)
C(9)	13860(30)	-1154(19)	-910(12)	102(7)
C(10)	14890(20)	-2866(16)	-851(11)	83(6)
C(11)	15650(20)	-3132(16)	-1807(12)	84(6)
C(12)	16790(30)	-4815(17)	-1732(12)	103(7)
C(13)	17660(20)	-5080(15)	-2715(11)	75(5)
C(14)	18880(20)	-6689(17)	-2643(11)	77(5)
C(15)	19590(20)	-6997(18)	-3601(10)	83(5)
C(16)	20860(20)	-8601(16)	-3486(10)	88(6)
N(17)	21310(20)	-9267(14)	-4381(9)	83(5)

C(18)	21770(20)	-8062(19)	-5199(13)	95(6)
C(19)	22950(20)	-10672(18)	-4155(12)	84(6)
C(20)	19800(20)	-9654(18)	-4600(11)	72(5)
Br(21)	25416(3)	-8136(3)	-3526(2)	124(2)
O(22)	23200(30)	-4300(20)	-4402(12)	174(9)

Table SM8. Bond lengths [A] and angles [deg] for ih129a.

C(1)-C(2)	1.24(2)
C(2)-C(3)	1.49(2)
C(3)-O(4)	1.193(19)
C(3)-O(5)	1.34(2)
O(5)-C(6)	1.423(17)
C(6)-C(7)	1.47(2)
C(7)-C(8)	1.56(2)
C(8)-C(9)	1.53(2)
C(9)-C(10)	1.53(2)
C(10)-C(11)	1.50(2)
C(11)-C(12)	1.528(19)
C(12)-C(13)	1.57(2)
C(13)-C(14)	1.497(19)
C(14)-C(15)	1.506(19)
C(15)-C(16)	1.50(2)
C(16)-N(17)	1.536(18)
N(17)-C(20)	1.48(2)
N(17)-C(18)	1.51(2)
N(17)-C(19)	1.535(19)

C(20)-C(20)#1	1.43(3)

C(1)-C(2)-C(3)	125(2)
O(4)-C(3)-O(5)	121.8(17)
O(4)-C(3)-C(2)	123.1(17)
O(5)-C(3)-C(2)	115(2)
C(3)-O(5)-C(6)	119.4(13)
O(5)-C(6)-C(7)	109.6(14)
C(6)-C(7)-C(8)	112.4(14)
C(9)-C(8)-C(7)	113.2(13)
C(8)-C(9)-C(10)	113.2(13)
C(11)-C(10)-C(9)	113.3(12)
C(10)-C(11)-C(12)	113.2(13)
C(11)-C(12)-C(13)	113.5(13)
C(14)-C(13)-C(12)	114.5(12)
C(13)-C(14)-C(15)	114.7(13)
C(16)-C(15)-C(14)	112.6(12)
C(15)-C(16)-N(17)	118.5(12)
C(20)-N(17)-C(18)	113.6(13)
C(20)-N(17)-C(19)	114.1(13)
C(18)-N(17)-C(19)	105.3(14)
C(20)-N(17)-C(16)	107.4(14)
C(18)-N(17)-C(16)	108.1(12)
C(19)-N(17)-C(16)	108.2(12)
C(20)#1-C(20)-N(17)	108.8(19)

Symmetry transformations used to generate equivalent atoms:

#1 -x+4,-y-2,-z-1

Table SM9. Anisotropic displacement parameters (A^2 x 10^3) for ih129a.

The anisotropic displacement factor exponent takes the form:

-2 pi^2 [h^2 a*^2 U11 + ... + 2 h k a* b* U12]

	U11	U22	U33	U23	U13	U12
C(1)	160(20)	99(15)	131(18)	-66(15)	45(16)	-21(14)
C(2)	106(14)	47(11)	110(14)	-33(10)	13(12)	-49(10)
C(3)	150(19)	77(16)	96(17)	-28(14)	59(15)	-56(13)
O(4)	207(16)	63(8)	102(11)	-18(8)	53(11)	-42(9)
O(5)	131(10)	51(7)	74(8)	-10(6)	16(7)	-19(7)
C(6)	114(15)	60(12)	103(15)	-31(10)	28(12)	-39(11)
C(7)	140(17)	91(14)	62(11)	-21(10)	17(12)	-39(12)
C(8)	133(16)	51(10)	75(12)	-20(8)	-3(11)	-19(10)
C(9)	141(17)	91(14)	70(12)	-32(10)	19(11)	-26(12)
C(10)	103(14)	68(11)	65(11)	-18(9)	21(10)	-16(10)
C(11)	118(14)	56(10)	85(13)	-25(9)	-18(11)	-25(10)
C(12)	169(19)	62(11)	83(13)	-26(10)	24(13)	-42(11)
C(13)	110(13)	52(10)	73(12)	-20(8)	2(10)	-34(10)
C(14)	111(14)	71(12)	76(12)	-25(9)	17(10)	-64(11)
C(15)	122(15)	81(12)	43(10)	-16(9)	14(10)	-33(11)
C(16)	166(17)	48(10)	60(11)	-23(8)	17(11)	-44(10)
N(17)	150(15)	51(8)	44(9)	-4(7)	10(9)	-33(9)
C(18)	130(16)	79(13)	86(14)	-36(11)	5(12)	-36(11)
C(19)	80(13)	69(11)	98(13)	-27(9)	6(10)	-13(10)
C(20)	101(14)	77(11)	49(11)	-14(8)	1(10)	-46(10)

Br(21)	138(2)	141(2)	129(2)	-85(2)	32(2)	-58(2)
O(22)	220(20)	141(15)	120(14)	-12(12)	-8(14)	-22(14)

Table SM10. Hydrogen coordinates (x 10^4) and isotropic displacement parameters ($Å^2$ x 10^3) for.

	x	y	z	U(eq)
H(1A)	7443	4856	2634	157
H(1B)	6894	6506	1825	157
H(2)	8439	5441	770	96
H(6A)	10556	426	1178	107
H(6B)	12199	774	1413	107
H(7A)	12764	1488	-226	117
H(7B)	11102	1188	-473	117
H(8A)	13981	-1234	537	106
H(8B)	12324	-1530	281	106
H(9A)	14601	-514	-1132	123
H(9B)	12945	-812	-1387	123
H(10A)	15812	-3203	-380	99
H(10B)	14151	-3508	-620	99
H(11A)	16322	-2435	-2062	101
H(11B)	14724	-2868	-2265	101
H(12A)	16096	-5505	-1511	124
H(12B)	17671	-5096	-1247	124
H(13A)	16771	-4870	-3184	90
H(13B)	18274	-4330	-2960	90
H(14A)	18300	-7443	-2336	92
H(14B)	19832	-6858	-2224	92
H(15A)	18652	-6881	-4012	100
H(15B)	20141	-6224	-3923	100
H(16A)	20436	-9323	-2989	106

H(16B)	21923	-8596	-3239	106
H(18A)	22755	-7862	-5012	142
H(18B)	20823	-7110	-5334	142
H(18C)	22037	-8448	-5770	142
H(19A)	23871	-10335	-4020	127
H(19B)	23245	-11112	-4704	127
H(19C)	22769	-11448	-3599	127
H(20A)	19515	-10376	-4036	86
H(20B)	18819	-8713	-4760	86