Supporting Information

Photolysis of 1-Alkylcycloalkanols in the Presence of (Diacetoxyiodo)benzene and I_2. Intramolecular Selectivity in the β-Scission Reactions of the Intermediate 1-Alkylcycloalkoxyl Radicals

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Synthesis of the substrates

1) 1-alkylcyclobutanols (1f-g)

1-Allyl and 1-benzylcyclobutanol were prepared by reaction of cyclobutanone with the appropriate alkylmagnesium chloride in anhydrous tetrahydrofuran, purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

*1-Allylcyclobutanol (**1f**):*

^{1}H NMR ($CDCl_3$): δ 5.89-5.81 (m, 1H, -CH_2CH=CH_2), δ 5.21-5.15 (m, 2H, -CH_2CH=CH_2), δ 2.40-2.37 (m, 2H, -CH_2CH=CH_2), δ 2.13-2.04 (m, 4H, CH_2), δ 1.86-1.62 (m, 1H, CH_2), δ 1.59-1.46 (m, 1H, CH_2).

GC-MS m/z (relative abundance): 83, 71 (100), 56.

*1-Benzylcyclobutanol (**1g**):*

^{1}H NMR ($CDCl_3$): δ 7.30-7.25 (m, 5H, Ar*H*), δ 2.90 (s, 2H, ArCH_2), δ 2.21-2.12 (m, 2H, CH_2), δ 2.02-1.98 (m, 2H, CH_2), δ 1.82-1.78 (m, 1H, CH_2), δ 1.67-1.58 (m, 1H, CH_2).[S1]

GC-MS m/z (relative abundance): 162 (M^+), 134, 133, 116, 91 (100), 71, 51.

2) 1-alkylcyclopentanols (2a-i)

1-Ethyl, 1-propyl, 1-allyl, 1-benzyl and 1-phenylcyclopentanol were prepared by reaction of cyclopentanone with the appropriate alkylmagnesium chloride in anhydrous tetrahydrofuran, purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

*1-Ethylcyclopentanol (**2b**):*

^{1}H NMR ($CDCl_3$): δ 1.86-1.55 (m, 10H, (CH_2)$_4$ and CH_2CH_3), δ 0.97 (t, 3H, CH_2CH_3).[S2]

GC-MS m/z (relative abundance): 85 (100), 72, 67, 57.[S3]

*1-Propylcyclopentanol (**2c**):*

^{1}H NMR ($CDCl_3$): δ 1.86-1.30 (m, 12H, (CH_2)$_4$ and $CH_2CH_2CH_3$), δ 0.94 (t, 3H, $CH_2CH_2CH_3$).

GC-MS m/z (relative abundance): 99, 85 (100), 72, 67, 57.

*1-Isopropylcyclopentanol (**2d**)* was prepared by reaction of isopropylmagnesium chloride with cyclopentanone in the presence of $CeCl_3$ according to a procedure reported in the literature,[S4] purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.89-1.47 (m, 9H, (CH_2)$_4$ and C*H*(CH_3)$_2$), δ 1.05 (s, 1H, O*H*), δ 0.95 (d, 6H, CH(C*H*$_3$)$_2$).

GC-MS m/z (relative abundance): 99, 85 (100), 72, 67, 57.

*1-tert-Butylcyclopentanol (**2e**)* was prepared by reaction of *tert*-butyllithium (solution 1.7 M in heptane) with cyclopentanone at – 78 °C according to a procedure reported in the literature,[S5] purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.83-1.42 (m, 8H, (CH_2)$_4$), δ 0.97 (s, 9H, C(C*H*$_3$)$_3$).[S6]

GC-MS m/z (relative abundance): 109, 85 (100), 67, 57.

*1-Allylcyclopentanol (**2f**):*

^{1}H NMR ($CDCl_3$): δ 5.97-5.83 (m, 1H, -CH_2C*H*=CH_2), δ 5.17-5.12 (m, 2H, -CH_2CH=C*H*$_2$), δ 2.35-2.33 (m, 2H, -C*H*$_2$CH=CH_2), δ 1.82-1.78 (m, 2H, C*H*$_2$), δ 1.72-1.51 (m, 6H, C*H*$_2$).[S7]

GC-MS m/z (relative abundance): 97, 85 (100), 67, 55.

*1-Benzylcyclopentanol (**2g**):*

^{1}H NMR ($CDCl_3$): δ 7.35-7.18 (m, 5H, Ar*H*), δ 2.90 (s, 2H, ArC*H*$_2$), δ 1.90-1.75 (m, 2H, C*H*$_2$), δ 1.74-1.51 (m, 6H, C*H*$_2$).[S8]

GC-MS m/z (relative abundance): 92 (100), 85, 67, 57, 55.

*1-Phenylcyclopentanol (**2h**):*

^{1}H NMR ($CDCl_3$): δ 7.48-7.24 (m, 5H, Ar*H*), δ 2.03-1.82 (m, 8H, (CH_2)$_4$), δ 1.62 (s, 1H, O*H*).[S9]

GC-MS m/z (relative abundance): 162 (M^+), 144, 133 (100), 128, 115, 105, 77, 55.

*1-Neopentylcyclopentanol (**2i**)* was prepared by reaction of neopentylmagnesium chloride with cyclopentanone in the presence of $CeCl_3$ (powdered in a mortar and then heated to 140 °C under vacuum for 2 hours before use), purified by column chromatography (basic alumina, eluent hexane) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.77-1.59 (m, 10H, C*H*$_2$), δ 1.21 (s, 1H, O*H*), δ 1.04-1.01 (m, 9H, C(C*H*$_3$)$_3$).

GC-MS m/z (relative abundance): 141, 99, 85, 71, 57 (100).

3) 1-alkylcyclohexanols (3a-e, 3g-i)

1-Ethyl, 1-propyl, 1-benzyl, 1-phenyl and 1-neopentylcyclohexanol were prepared by reaction of cyclohexanone with the appropriate alkylmagnesium chloride in anhydrous tetrahydrofuran, purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

*1-Ethylcyclohexanol (**3b**):*

^{1}H NMR ($CDCl_3$): δ 1.69-1.23 (m, 12H, (C*H*$_2$)$_5$ and C*H*$_2$CH$_3$), δ 0.90 (t, 3H, CH$_2$C*H*$_3$).[S10]

GC-MS m/z (relative abundance): 99 (100), 85, 81, 72, 57.

*1-Propylcyclohexanol (**3c**):*

^{1}H NMR ($CDCl_3$): δ 1.70-1.25 (m, 14H, (C*H*$_2$)$_5$ and C*H*$_2$C*H*$_2$CH$_3$), δ 1.21 (s, 1H, O*H*), δ 0.97 (t, 3H, CH$_2$CH$_2$C*H*$_3$).

GC-MS m/z (relative abundance): 99 (100), 81, 71, 57.

*1-Isopropylcyclohexanol (**3d**)* was prepared by reaction of isopropylmagnesium chloride with cyclohexanone in the presence of $CeCl_3$ according to a procedure reported in the literature,[S4] purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.65-1.47 (m, 8H, (C*H*$_2$)$_4$), δ 1.43-1.32 (m, 2H, C*H*$_2$), δ 1.25-1.12 (m, 1H, C*H*(CH$_3$)$_2$), δ 1.08 (s, 1H, O*H*), δ 0.91 (d, 6H, CH(C*H*$_3$)$_2$).[S10]

GC-MS m/z (relative abundance): 99 (100), 81, 71, 55.

*1-tert-Butylcyclohexanol (**3e**)* was prepared by reaction of *tert*-butyllithium (solution 1.7 M in heptane) with cyclohexanone at –78 °C according to a procedure reported in the literature,[S5] purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.67-1.32 (m, 10H, (C*H*$_2$)$_5$), δ 0.92 (s, 9H, C(C*H*$_3$)$_3$).[S11]

GC-MS m/z (relative abundance): 123, 99 (100), 81, 67, 57.

*1-Benzylcyclohexanol (**3g**):*

^{1}H NMR ($CDCl_3$): δ 7.32-7.15 (m, 5H, Ar*H*), δ 2.75 (s, 2H, ArC*H*$_2$), δ 1.68-1.40 (m, 10H, (C*H*$_2$)$_5$).[S12]

GC-MS m/z (relative abundance): 99, 92 (100), 91, 81, 65, 55.

*1-Phenylcyclohexanol (**3h**):*

^{1}H NMR ($CDCl_3$): δ 7.25-7.21 (m, 5H, Ar*H*), δ 1.82-1.58 (m, 10H, (C*H*$_2$)$_5$), δ 1.33-1.28 (m, 1H, O*H*).[S13]

GC-MS m/z (relative abundance): 176 (M^+), 158, 143, 133, 120, 115, 105, 91, 77, 55 (100).

*1-Neopentylcyclohexanol (**3i**):*

^{1}H NMR ($CDCl_3$): δ 1.63-1.41 (m, 12H, C*H*$_2$), δ 1.23 (s, 1H, O*H*), δ 1.04 (s, 9H, C(C*H*$_3$)$_3$).

GC-MS m/z (relative abundance): 170 (M^+), 155, 137, 127, 114, 99 (100), 96, 81, 71, 67, 57.

4) 1-alkylcycloheptanols (4c-e, 4g, 4h)

1-Propyl, 1-benzyl and 1-phenylcycloheptanol were prepared by reaction of cycloheptanone with the appropriate alkylmagnesium chloride in anhydrous tetrahydrofuran, purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

*1-Propylcycloheptanol (**4c**):*

^{1}H NMR ($CDCl_3$): δ 1.65-1.36 (m, 16H, $(CH_2)_6$ and CH_2CH_2), δ 0.94-0.90 (t, 3H, CH_3).

GC-MS m/z (relative abundance): 156 (M^+), 141, 138, 127, 123, 113 (100), 99, 95, 86, 81, 67, 57, 55.

*1-Isopropylcycloheptanol (**4d**):* was prepared by reaction of isopropyllithium (solution 0.7 M in pentane) with cycloheptanone at – 78 °C, purified by column chromatography (basic alumina, eluent hexane/ethyl acetate 50:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.72-1.47 (m, 13H, $(CH_2)_6$, $CH(CH_3)_2$), δ 0.91 (d, 6H, $CH(CH_3)_2$).

GC-MS m/z (relative abundance): 113 (100), 99, 95, 86, 67, 55.

*1-tert-butylcycloheptanol (**4e**)* was prepared by reaction of *tert*-butyllithium (solution 1.7 M in heptane) with cycloheptanone at –78 °C according to a procedure reported in the literature,[S5] purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.81-1.43 (m, 12H, $(CH_2)_6$), δ 0.94 (s, 9H, $C(CH_3)_3$).[S14]

GC-MS m/z (relative abundance): 152, 137, 123, 113 (100), 95, 81, 79, 67, 57, 55.

*1-Benzylcycloheptanol (**4g**):*

^{1}H NMR ($CDCl_3$): δ 7.26-7.19 (m, 5H, Ar*H*), δ 2.75 (m, 2H, $ArCH_2$), δ 2.04-1.25 (m, 12H, $(CH_2)_6$).[S15]

GC-MS m/z (relative abundance): 186, 129, 113 (100), 95, 92, 91, 67, 55.

*1-Phenylcycloheptanol (**4h**)*

^{1}H NMR ($CDCl_3$): δ 7.48-7.23 (m, 5H, Ar*H*), δ 2.11-1.59 (m, 13H, $(CH_2)_6$ and O*H*).[S16]

GC-MS m/z (relative abundance): 190 (M^+), 172, 157, 144, 133 (100), 124, 115, 104, 91, 77, 55.

5) 1-alkylcyclooctanols (5c-e, 5g, 5h)

1-Propyl, 1-benzyl and 1-phenylcyclooctanol were prepared by reaction of cyclooctanone with the appropriate alkylmagnesium chloride in anhydrous tetrahydrofuran, purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

*1-Propylcyclooctanol (**5c**):*

^{1}H NMR ($CDCl_3$): δ 1.75-1.34 (m, 18H, (CH_2)$_7$ and CH_2CH_2), δ 0.95-0.90 (t, 3H, CH_3).

GC-MS m/z (relative abundance): 170 (M^+), 152, 141, 127 (100), 123, 109, 99, 87, 86, 71, 67, 58.

*1-Isopropylcyclooctanol (**5d**):* was prepared by reaction of isopropyllithium (solution 0.7 M in pentane) with cyclooctanone at – 78 °C, purified by column chromatography (basic alumina, eluent hexane/ethyl acetate 50:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.80-1.32 (m, 15H, (CH_2)$_7$ and CH(CH_3)$_2$), δ 0.91 (d, 6H, CH(CH_3)$_2$).

GC-MS m/z (relative abundance): 127 (100), 109, 99, 86, 81, 71, 67, 57, 55.

*1-tert-Butylcyclooctanol (**5e**):* was prepared by reaction of *tert*-butyllithium (solution 1.7 M in heptane) with cyclooctanone at – 78 °C according to a procedure reported in the literature,[S5] purified by column chromatography (silica gel, eluent hexane/ethyl acetate 10:1) and identified by GC-MS and ^{1}H NMR.

^{1}H NMR ($CDCl_3$): δ 1.78-1.45 (m, 14H, (CH_2)$_7$), δ 0.96 (s, 9H, C(CH_3)$_3$).

GC-MS m/z (relative abundance): 166, 151, 138, 127, 122, 109, 95, 83, 81, 69, 67, 57 (100).

*1-Benzylcyclooctanol (**5g**):*

^{1}H NMR ($CDCl_3$): δ 7.26-7.20 (m, 5H, Ar*H*), δ 2.75 (m, 2H, ArCH_2), δ 1.69-1.48 (m, 14H, (CH_2)$_7$).[S15]

GC-MS m/z (relative abundance): 200, 172, 143, 127, 109, 104, 91, 81, 67 (100), 55.

*1-Phenylcyclooctanol (**5h**):*

^{1}H NMR ($CDCl_3$): δ 7.53-7.25 (m, 5H, Ar*H*), δ 2.09-1.56 (m, 14H, (CH_2)$_7$).[S17]

GC-MS m/z (relative abundance): 204 (M^+), 186, 171, 158, 143, 129, 118 (100), 105, 91, 77, 55.

^{1}H NMR and GC-MS characterization of reaction products

1) Products from 1-alkylcyclobutanols (1f-g):

a) Products from 1-allylcyclobutanol (1f):

7-iodo-1-hepten-4-one

^{1}H NMR ($CDCl_3$): δ 5.99-5.85 (m, 1H, CH_2=C*H*CH_2), δ 5.22-5.13 (m, 2H, C*H*$_2$=CHCH_2), δ 3.24-3.18 (m, 4H, CH_2=CHC*H*$_2$ and C*H*$_2$I), δ 2.61 (t, 2H, C(O)C*H*$_2$$CH_2$$CH_2$I), δ 2.15-2.03 (m, 2H, CH_2C*H*$_2$$CH_2$I).

GC-MS m/z (relative abundance): 197 (100), 169, 161, 127, 118, 104, 91, 65, 63.

b) Products from 1-benzylcyclobutanol (1g):

5-iodo-1-phenylpentan-2-one

^{1}H NMR ($CDCl_3$): δ 7.43-7.33 (m, 5H, Ar*H*), δ 3.70 (s, 2H, ArC*H*$_2$), δ 3.17 (t, 2H, C*H*$_2$I), δ 2.61 (t, 2H, C(O)C*H*$_2$), δ 2.02-1.95 (m, 2H, C(O)CH_2C*H*$_2$$CH_2$I).

GC-MS m/z (relative abundance): 197 (100), 169, 155, 141, 127, 111, 69, 68.

2) Products from 1-alkylcyclopentanols (2a-i):

a) Products from 1-methylcyclopentanol (2a):

6-iodohexan-2-one

^{1}H NMR ($CDCl_3$): δ 3.18 (t, 2H, C*H*$_2$I), δ 2.46 (t, 2H, C(O)C*H*$_2$$(CH_2)_3$I), δ 2.11 (s, 3H, C*H*$_3$C(O)), δ 1.85-1.80 (m, 2H, C(O)$(CH_2)_2$C*H*$_2$$CH_2$I), δ 1.73-1.65 (m, 2H, C(O)CH_2C*H*$_2$$(CH_2)_2$I).[S18]

GC-MS m/z (relative abundance): 155, 127, 99 (100), 71, 55.

b) Products from 1-ethylcyclopentanol (2b):

7-iodoheptan-3-one

^{1}H NMR ($CDCl_3$): δ 3.18 (t, 2H, C*H*$_2$I), δ 2.46-2.39 (m, 4H, CH_3C*H*$_2$C(O) and C(O)C*H*$_2$$(CH_2)_3$I), δ 1.84-1.78 (m, 2H, C(O)$(CH_2)_2$C*H*$_2$$CH_2$I), δ 1.71-1.63 (m, 2H, C(O)CH_2C*H*$_2$$(CH_2)_2$I), δ 1.06 (t, 3H, C*H*$_3$$CH_2$C(O)).

GC-MS m/z (relative abundance): 183, 155, 127, 113, 85, 57 (100), 54.

c) Products from 1-propylcyclopentanol (2c):

8-iodooctan-4-one

^{1}H NMR ($CDCl_3$): δ 3.19 (t, 2H, C*H*$_2$I), δ 2.46-2.35 (m, 4H, CH_3CH_2C*H*$_2$C(O) and C(O)C*H*$_2$$(CH_2)_3$I), δ 1.90-1.55 (m, 4H, C(O)$CH_2$$(CH_2)_2$$CH_2$I), δ 0.89 (t, 3H, C*H*$_3$$CH_2CH_2$C(O)).

GC-MS m/z (relative abundance): 183, 127, 71 (100), 55.

d) Products from 1-isopropylcyclopentanol (2d):

7-iodo-2-methylheptan-3-one

^{1}H NMR ($CDCl_3$): δ 3.18 (t, 2H, CH_2I), δ 2.63-2.53 (m, 1H, CH(CH_3)$_2$), δ 2.46 (t, 2H, C(O)CH_2(CH_2)$_3$I), δ 1.97-1.55 (m, 4H, C(O)CH_2(CH_2)$_2$$CH_2$I), δ 1.1 (d, 6H, CH(C$H_3$)$_2$).

GC-MS m/z (relative abundance): 183, 127, 71, 55 (100).

e) Products from 1-tert-butylcyclopentanol (2e):

7-iodo-2,2-dimethylheptan-3-one

^{1}H NMR ($CDCl_3$): δ 3.18 (t, 2H, CH_2I), δ 2.51 (t, 2H, C(O)CH_2(CH_2)$_3$I), δ 2.08-1.92 (m, 2H, C(O)(CH_2)$_2$C$H_2$$CH_2$I), δ 1.62-1.50 (m, 2H, C(O)CH_2CH_2(CH_2)$_2$I), δ 0.96 (s, 9H, C(CH_3)$_3$).

GC-MS m/z (relative abundance): 183, 141, 125, 83, 69, 57 (100), 55.

f) Products from 1-allylcyclopentanol (2f):

8-iodo-1-octen-4-one

^{1}H NMR ($CDCl_3$): δ 5.99-5.85 (m, 1H, CH_2=C$H$$CH_2$), δ 5.22-5.11 (m, 2H, C$H_2$=$CHCH_2$), δ 3.20-3.15 (m, 4H, C$H_2$I and CH_2=CHCH_2) δ 2.48 (t, 2H, C(O)CH_2(CH_2)$_3$I), δ 1.95-1.90 (m, 2H, C$H_2$$CH_2$I), δ 1.53-1.45 (m, 2H, C(O)CH_2CH_2(CH_2)$_2$I).

GC-MS m/z (relative abundance): 211, 183, 155, 125, 69, 55 (100).

g) Products from 1-benzylcyclopentanol (2g):

6-iodo-1-phenylhexan-2-one

^{1}H NMR ($CDCl_3$): δ 7.43-7.33 (m, 5H, ArH), δ 3.68 (s, 2H, ArCH_2C(O)), δ 3.11 (t, 2H, CH_2I), δ 2.47 (t, 2H, C(O)CH_2(CH_2)$_3$I), δ 1.85-1.61 (m, 4H, C(O)CH_2(CH_2)$_2$$CH_2$I).

GC-MS m/z (relative abundance): 211, 183, 175, 91, 65, 55 (100).

h) Products from 1-phenylcyclopentanol (2h):

5-iodo-1-phenylpentan-1-one

^{1}H NMR ($CDCl_3$): δ 7.97-7.94 (m, 2H, ArH), δ 7.55-7.50 (m, 3H, ArH), δ 3.23 (t, 2H, CH_2I), δ 3.01 (t, 2H, C(O)CH_2(CH_2)$_3$I), δ 2.08-2.03 (m, 2H, C(O)(CH_2)$_2$C$H_2$$CH_2$I), δ 1.71-1.66 (m, 2H, C(O)CH_2CH_2(CH_2)$_2$I).[S19]

GC-MS m/z (relative abundance): 160, 145, 131, 115, 105 (100), 91, 77, 63, 51.

i) Products from 1-(2,2-dimethyl)propylcyclopentanol (2i):

2,2-dimethyl-8-iodooctan-4-one

^{1}H NMR ($CDCl_3$): δ 3.17 (t, 2H, CH_2I), δ 2.41 (t, 2H, C(O)CH_2(CH_2)$_3$I), δ 2.29 (s, 2H, (CH_3)$_3$CCH_2C(O)), δ 1.84-1.76 (m, 2H, C(O)(CH_2)$_2$C$H_2$$CH_2$I), δ 1.68-1.60 (m, 2H, C(O)CH_2CH_2(CH_2)$_2$I), δ 1.01 (s, 9H, C(CH_3)$_3$).

GC-MS m/z (relative abundance): 226, 211, 183, 155, 141, 127, 111, 99, 81, 71, 57 (100), 51.

3) Products from 1-alkylcyclohexanols (3a-e, 3g-i):

a) Products from 1-methylcyclohexanol (3a):

7-iodoheptan-2-one

^{1}H NMR ($CDCl_3$): δ 3.19 (t, 2H, C*H*$_2$I), δ 2.45 (t, 2H, C(O)C*H*$_2$(CH$_2$)$_4$I), δ 2.15 (s, 3H, C*H*$_3$C(O)), δ 1.87-1.78 (m, 2H, C(O)(CH$_2$)$_3$C*H*$_2$CH$_2$I), δ 1.66-1.31 (m, 4H, C(O)CH$_2$(C*H*$_2$)$_2$CH$_2$CH$_2$I).[S18]

GC-MS m/z (relative abundance): 155, 141, 127, 113 (100), 95, 71, 58, 55.

b) Products from 1-ethylcyclohexanol (3b):

8-iodooctan-3-one

^{1}H NMR ($CDCl_3$): δ 3.19 (t, 2H, C*H*$_2$I), δ 2.46-2.36 (m, 4H, CH$_3$C*H*$_2$C(O) and C(O)C*H*$_2$(CH$_2$)$_4$I), δ 1.88-1.78 (m, 2H, C(O)(CH$_2$)$_3$C*H*$_2$CH$_2$I), δ 1.65-1.36 (m, 4H, C(O)CH$_2$C*H*$_2$(CH$_2$)$_3$I and C(O)(CH$_2$)$_2$C*H*$_2$(CH$_2$)$_2$I), δ 1.06 (t, 3H, C*H*$_3$CH$_2$C(O)).

GC-MS m/z (relative abundance): 155, 141, 127, 113 (100), 95, 71, 58, 55.

c) Products from 1-propylcyclohexanol (3c):

9-iodononan-4-one

^{1}H NMR ($CDCl_3$): δ 3.19 (t, 2H, C*H*$_2$I), δ 2.43-2.35 (m, 4H, CH$_3$CH$_2$C*H*$_2$C(O) and C(O)C*H*$_2$(CH$_2$)$_4$I), δ 1.88-1.78 (m, 2H, C(O)(CH$_2$)$_3$C*H*$_2$CH$_2$I), δ 1.63-1.36 (m, 4H, C(O)CH$_2$C*H*$_2$CH$_2$(CH$_2$)$_2$I and C(O)CH$_2$CH$_2$C*H*$_2$(CH$_2$)$_2$I), δ 0.91 (t, 3H, C*H*$_3$CH$_2$CH$_2$).

GC-MS m/z (relative abundance): 268 (M^+), 253, 225, 213, 197, 169, 141, 127, 113, 86, 71 (100), 58.

d) Products from 1-isopropylcyclohexanol (3d):

8-iodo-2-methyloctan-3-one

^{1}H NMR ($CDCl_3$): δ 3.19 (t, 2H, C*H*$_2$I), δ 2.61-2.57 (m, 1H, C*H*(CH$_3$)$_2$), δ 2.46 (t, 2H, C(O)C*H*$_2$CH$_2$), δ 1.77-1.67 (m, 2H, C(O)(CH$_2$)$_3$C*H*$_2$CH$_2$I), δ 1.43-1.38 (m, 4H, C(O)CH$_2$C*H*$_2$(CH$_2$)$_3$I and C(O)(CH$_2$)$_2$C*H*$_2$(CH$_2$)$_2$I), δ 1.09 (d, 6H, CH(C*H*$_3$)$_2$).

GC-MS m/z (relative abundance): 223, 168, 139, 127, 95, 81, 69, 55 (100).

e) Products from 1-phenylcyclohexanol (3h):

6-iodo-1-phenylhexan-1-one

^{1}H NMR ($CDCl_3$): δ 7.97-7.95 (m, 2H, Ar*H*), δ 7.49-7.46 (m, 3H, Ar*H*), δ 3.21 (t, 2H, C*H*$_2$I), δ 2.99 (t, 2H, C(O)C*H*$_2$(CH$_2$)$_4$I), δ 1.93-1.86 (m, 2H, C(O)(CH$_2$)$_3$C*H*$_2$CH$_2$I), δ 1.69-1.64 (m, 2H, C(O)CH$_2$C*H*$_2$(CH$_2$)$_3$I), δ 1.54-1.47 (m, 2H, C(O)(CH$_2$)$_2$C*H*$_2$(CH$_2$)$_2$I).[S20]

GC-MS m/z (relative abundance): 302 (M^+), 231, 203, 175, 155, 133, 120, 105 (100), 77, 51.

f) Products from 1-(2,2-dimethyl)propylcyclohexanol (3i):

2,2-dimethyl-9-iodononan-4-one

^{1}H NMR ($CDCl_3$): δ 3.19 (t, 2H, CH_2I), δ 2.40 (t, 2H, C(O)CH_2(CH_2)$_4$I), δ 2.29 (s, 2H, (CH_3)$_3$CCH_2), δ 1.88-1.73 (m, 2H, C(O)(CH_2)$_3$C$H_2$$CH_2$I), δ 1.62-1.52 (m, 2H, C(O)(CH_2)$_2$CH_2(CH_2)$_2$I), δ 1.43-1.33 (m, 2H, C(O)CH_2CH_2(CH_2)$_3$I), δ 1.01 (s, 9H, C(CH_3)$_3$).

GC-MS m/z (relative abundance): 225, 197, 169, 155, 141, 127, 113, 99, 83, 69, 57 (100), 55.

4) Products from 1-alkylcycloheptanols (4c-e, 4g, 4h):

a) Products from 1-propylcycloheptanol (4c):

The reaction of 1-propylcycloheptanol (**4c**) led to the formation of comparable amounts of 10-iododecan-4-one, cycloheptanone and 1-iodopropane as major products accompanied by smaller amounts (together accounting for ≈ 23% of the detected products) of products identified as 1-propyl-3-cyclohepten-1-ol, 1-propyl-4-cyclohepten-1-ol and 4-iodo-1-propylcycloheptanol.

10-iododecan-4-one

^{1}H NMR ($CDCl_3$): δ 3.18 (t, 2H, CH_2I), δ 2.50 (t, 2H, C(O)CH_2(CH_2)$_5$I), δ 2.37 (t, 2H, CH_3CH_2CH_2C(O)), δ 1.88-1.76 (m, 2H, C(O) (CH_2)$_4$C$H_2$$CH_2$I), δ 1.47-1.38 (m, 8H, C(O)CH_2(CH_2)$_3$$CH_2$I, and CH_3C$H_2$$CH_2$C(O)), δ 0.87 (t, 3H, C$H_3CH_2CH_2$).

GC-MS m/z (relative abundance): 239, 196, 183, 169, 155, 141, 127, 111, 99, 86, 71 (100), 58, 53.

b) Products from 1-phenylcycloheptanol (4h):

7-iodo-1-phenylheptan-1-one

^{1}H NMR ($CDCl_3$): δ 7.97-7.94 (m, 2H, Ar*H*), δ 7.62-7.46 (m, 3H, Ar*H*), δ 3.19 (t, 2H, CH_2I), δ 2.98 (t, 2H, ArC(O)CH_2), δ 1.86-1.40 (m, 8H, ArC(O)CH_2(CH_2)$_4$$CH_2$I).

GC-MS m/z (relative abundance): 316 (M^+), 189, 171, 155, 120, 105 (100), 91, 77, 51.

5) Products from 1-alkylcyclooctanols (5c-e, 5g, 5h):

a) Products from 1-propylcyclooctanol (5c):

The reaction of 1-propylcyclooctanol (**5c**) led to the formation of 11-iodoundecan-4-one, cyclooctanone and 1-iodopropane (together accounting only for ≈ 19% of the detected products), accompanied by significant amounts of products identified as 1-propyl-3-cycloocten-1-ol, 1-propyl-4-cycloocten-1-ol, 4-iodo-1-propylcyclooctanol, and by a smaller amount of 6-iodo-1-propyl-4-cycloocten-1-ol.

11-iodoundecan-4-one

^{1}H NMR ($CDCl_3$): δ 3.18 (t, 2H, C*H*$_2$I), δ 2.43-2.35 (m, 2H, $CH_2CH_2C(O)CH_2$), δ 2.31-2.27 (m, 2H, $CH_3CH_2CH_2C(O)$), δ 1.79-1.25 (m, 12H, C*H*$_2$), δ 0.94-0.90 (t, 3H, $CH_3CH_2CH_2$).

GC-MS m/z (relative abundance): 253, 183, 169, 155, 127, 99, 86, 71 (100), 58.

b) Products from 1-phenylcyclooctanol (5h):

The reaction of 1-phenylcyclooctanol (**5h**) led to the formation of 1-phenyl-8-iodooctan-1-one, accompanied by significant amounts of products identified as 1-phenyl-3-cycloocten-1-ol, 1-phenyl-4-cycloocten-1-ol, 4-iodo-1-phenylcyclooctanol (together accounting for ≈ 43% of the detected products).

8-iodo-1-phenyloctan-1-one

^{1}H NMR ($CDCl_3$): δ 7.98-7.92 (m, 2H, Ar*H*), δ 7.54-7.49 (m, 3H, Ar*H*), δ 3.18 (t, 2H, C*H*$_2$I), δ 2.97 (t, 2H, ArC(O)C*H*$_2$), δ 1.85-1.38 (m, 10H, $ArC(O)CH_2(CH_2)_5CH_2I$.

GC-MS m/z (relative abundance): 330 (M^+), 254, 231, 203, 185, 169, 155, 120, 105 (100), 91, 77, 55.

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