

## Supporting Information

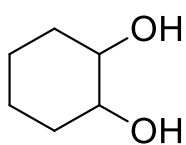
### Oxidative cleavage of cycloalkenes using hydrogen peroxide and a tungsten-based catalyst: towards a complete mechanistic investigation

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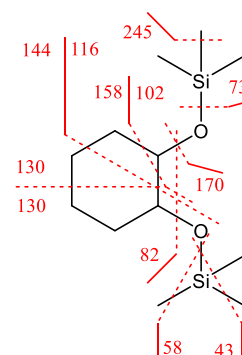
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E-mail: bruno.andrioletti@univ-lyon1.fr

#### 1. Characterization of by-products obtained during cyclohexene oxidative cleavage

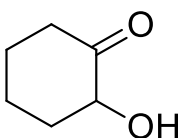


**1,2-Cyclohexanediol (C<sub>6</sub>H<sub>12</sub>O<sub>2</sub>)**

m/z (di-TMS derivative): 245, 177, 170, 155, 147, 142,  
133, 129, 115, 101, 81, 73, 59, 45.

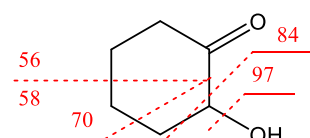


Molecular Weight: 260.52



**2-Hydroxycyclohexanone (C<sub>6</sub>H<sub>10</sub>O<sub>2</sub>)**

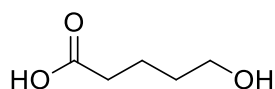
m/z: 114, 96, 83, 70, 57, 39.



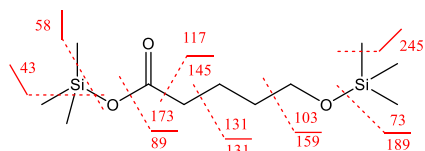
Molecular Weight: 114.14

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**5-Hydroxypentanoic acid (C<sub>5</sub>H<sub>10</sub>O<sub>3</sub>)**

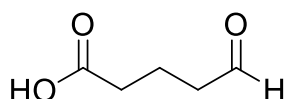


m/z (di-TMS derivative): 247, 221, 204, 189, 172, 157, 147, 133, 129, 116, 101, 89, 75, 73, 59, 45.

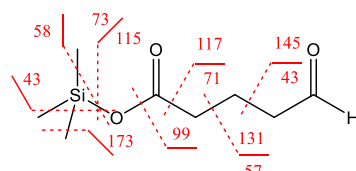


Molecular Weight: 262.50

**5-Oxopentanoic acid (C<sub>5</sub>H<sub>8</sub>O<sub>3</sub>)**

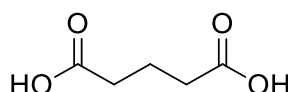


m/z (TMS derivative): 188, 173, 145, 131, 129, 115, 99, 75, 73, 59, 43.

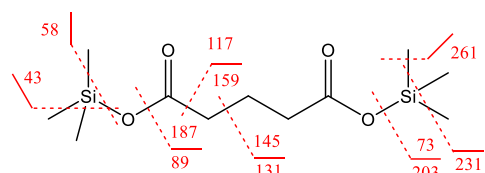


Molecular Weight: 188.30

**Glutaric acid (C<sub>5</sub>H<sub>8</sub>O<sub>4</sub>)**

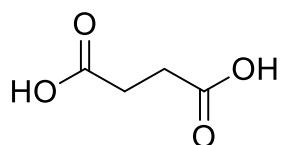


m/z (di-TMS derivative): 261, 233, 204, 186, 173, 158, 147, 129, 116, 97, 85, 73, 59, 45.

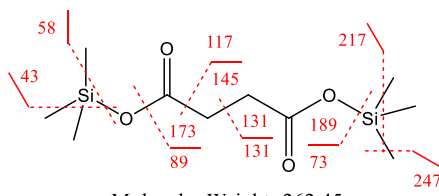


Molecular Weight: 276.48

**Succinic acid (C<sub>4</sub>H<sub>6</sub>O<sub>4</sub>)**

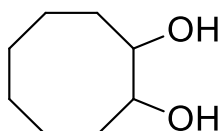


m/z (di-TMS derivative): 247, 218, 203, 186, 172, 160, 147, 129, 115, 101, 86, 75, 73, 55, 43.

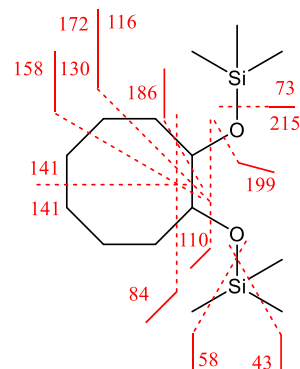


Molecular Weight: 262.45

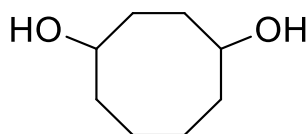
## 2. Characterization of by-products obtained during epoxidation of cycloalkenes

1,2- Cyclooctanediol ( $C_8H_{16}O_2$ )

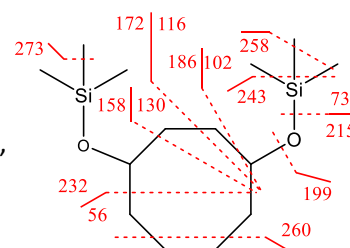
m/z (di-TMS derivative): 287, 217, 198, 185, 170, 155,  
147, 138, 129, 116, 109, 101, 93, 85, 73, 55, 45.



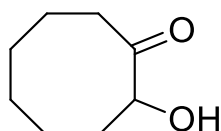
Molecular Weight: 288.58

1,4-Cyclooctanediol ( $C_8H_{16}O_2$ )

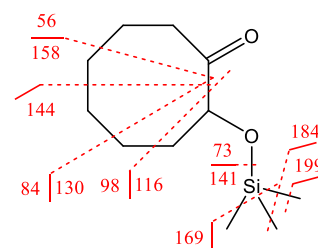
m/z (di-TMS derivative): 287, 273, 260,  
243, 231, 217, 207, 197, 185, 171, 155, 142,  
130, 115, 101, 73, 55, 45.



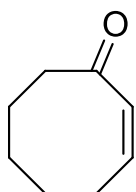
Molecular Weight: 288.58

2-Hydroxycyclooctanone ( $C_8H_{14}O_2$ )

m/z (TMS derivative): 214, 199, 183, 171, 157, 144,  
129, 117, 107, 96, 85, 73, 55, 45.

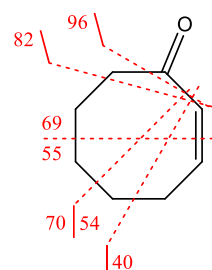


Molecular Weight: 214.38

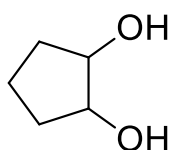


**2-Cyclooctenone (C<sub>8</sub>H<sub>12</sub>O)**

m/z: 124, 95, 81, 69, 53, 39.

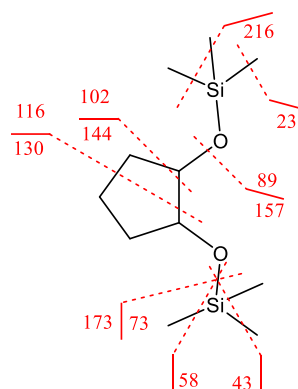


Molecular Weight: 124.18

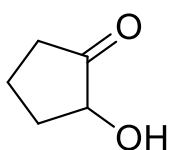


**1,2-Cyclopentanediol (C<sub>5</sub>H<sub>10</sub>O<sub>2</sub>)**

m/z (di-TMS derivative): 231, 217, 191, 175, 156,  
147, 133, 115, 101, 85, 75, 73, 59, 45.

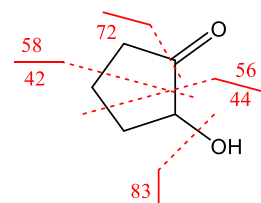


Molecular Weight: 246.50



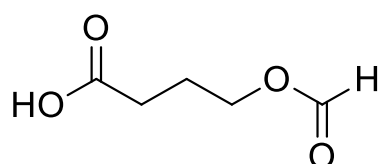
**2-Hydroxycyclopentanone (C<sub>5</sub>H<sub>8</sub>O<sub>2</sub>)**

m/z: 82, 72, 57, 44, 41, 39.

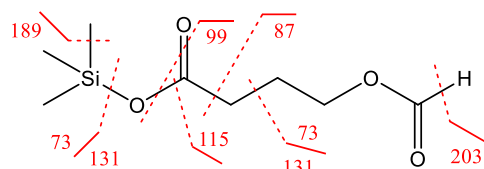


Molecular Weight: 100.12

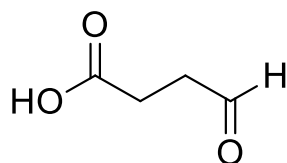
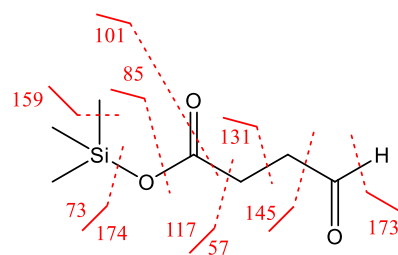
## ARTICLE

**4-Formyloxybutanoic acid (C<sub>5</sub>H<sub>8</sub>O<sub>4</sub>)**

m/z (TMS derivative):

203, 188, 147, 131, 114,  
100, 86, 73, 59, 45.

Molecular Weight: 204.30

**4-Oxobutanoic acid (C<sub>4</sub>H<sub>6</sub>O<sub>3</sub>)**m/z (TMS derivative): 173, 159, 144,  
131, 116, 102, 86, 73, 59.

Molecular Weight: 174.27