

## SUPPORTING INFORMATION

### Modeling Plasma-Induced Modifications in Alginate Biopolymers at the Atomic Scale

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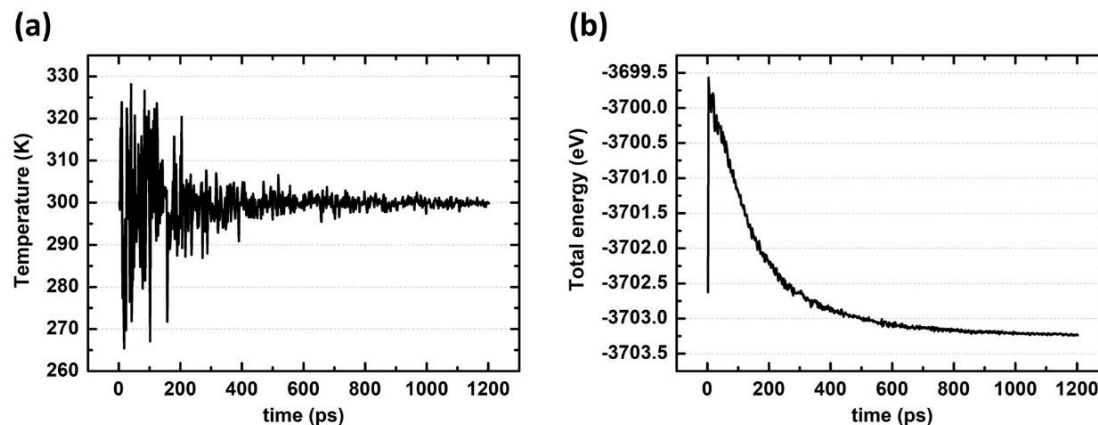
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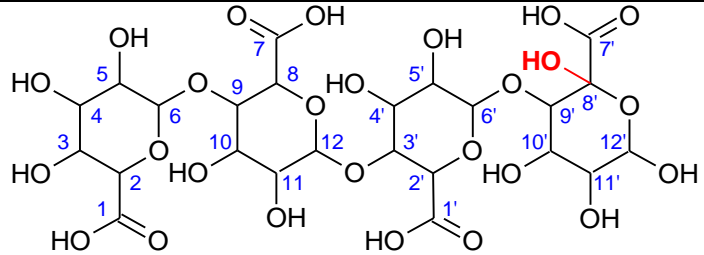
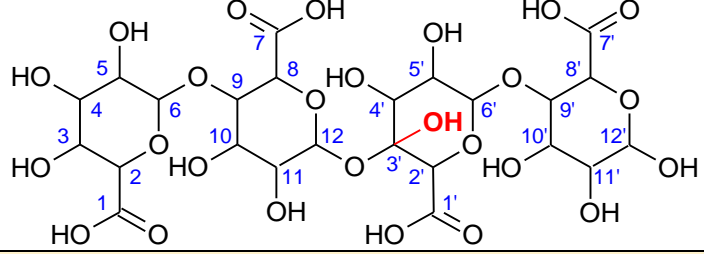
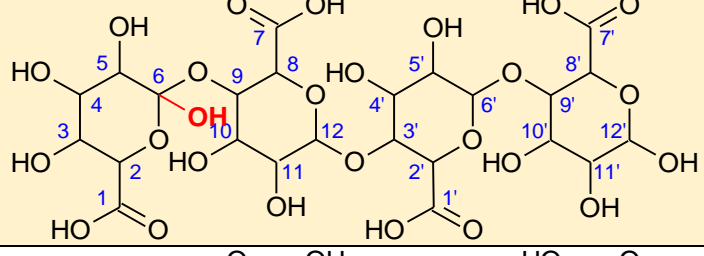
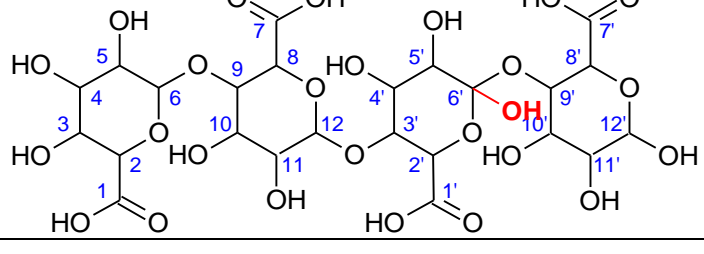
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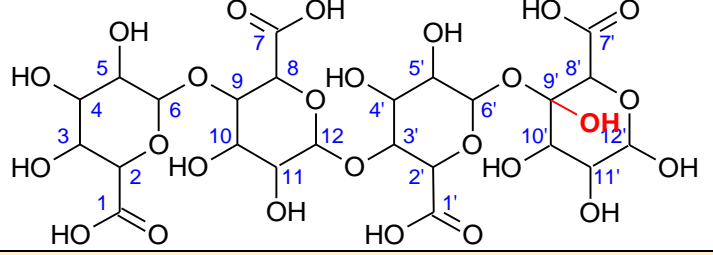
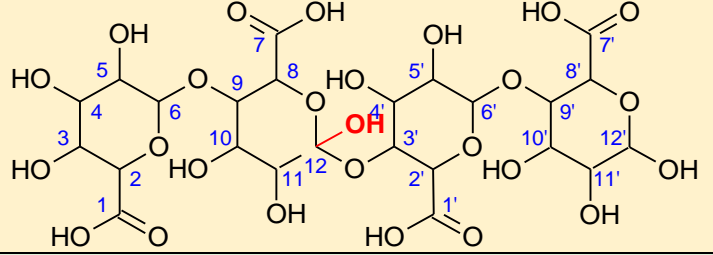
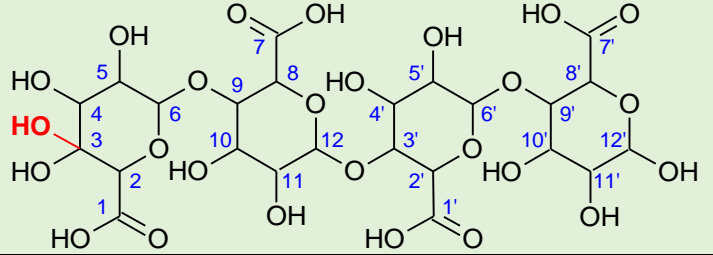
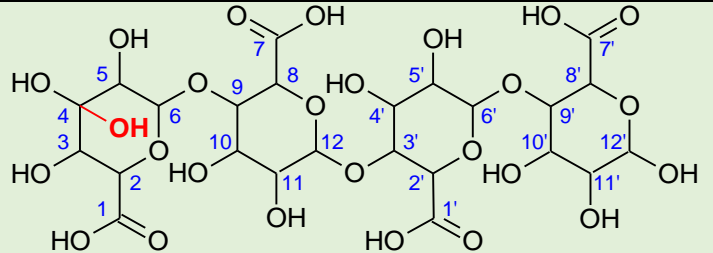


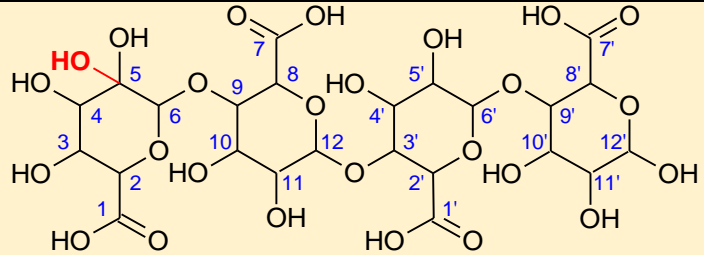
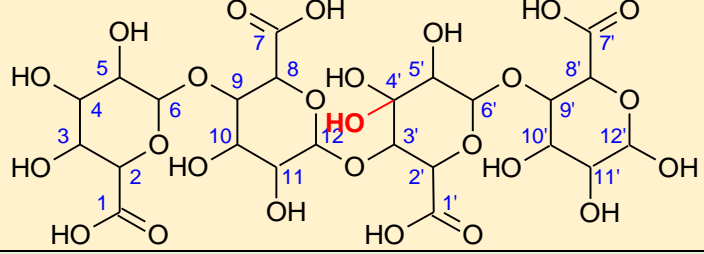
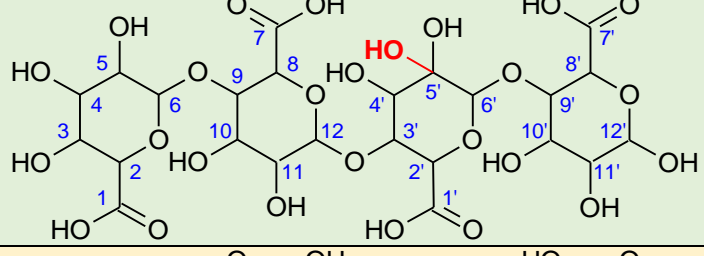
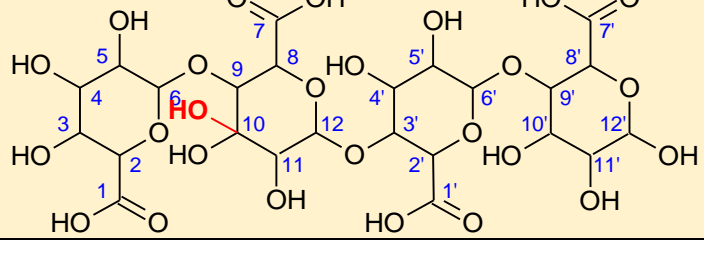
**Figure S1.** Time evolution of the temperature and total energy of the alginic acid model system, demonstrating that the equilibration time of 1200 ps was sufficient for obtaining a well-thermalized structure.

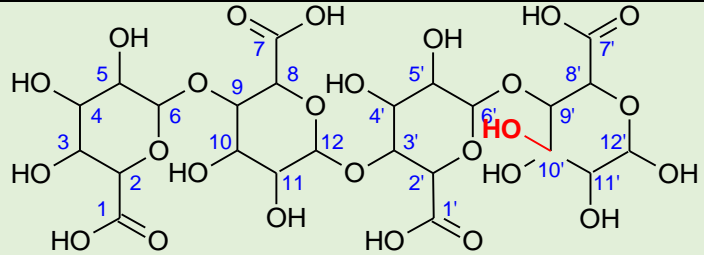
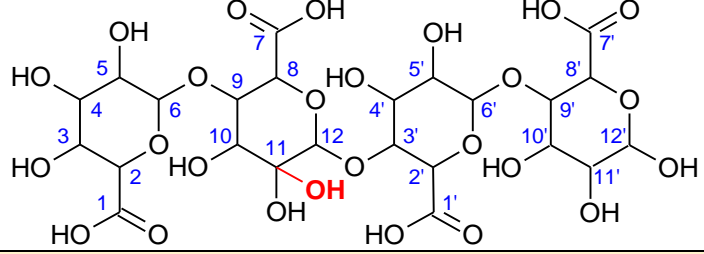
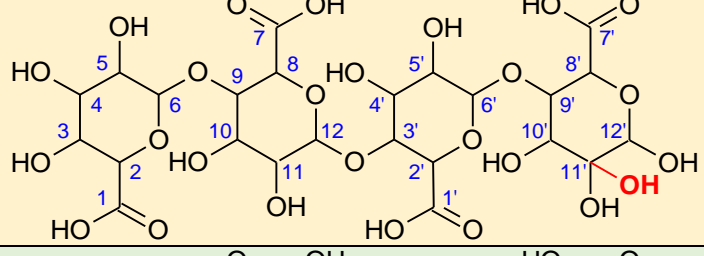
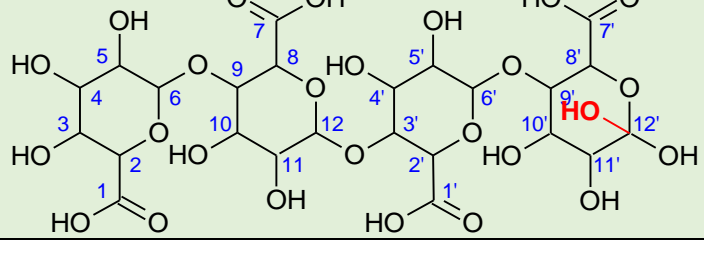
**Table S1.** Overview of all reaction mechanisms observed in the DFTB-MD simulations following the interaction of O atoms with the alginic acid tetramer. The numbering of the C atoms corresponds to Figure 1 in the main text. Note that most of the reactions are initiated by H-abstraction from different C or O atoms (1-75) and the last ones (76-85) are initiated by O addition. Color code: green = events that happen with frequency higher than 2.5%; yellow = events that happen with frequency between 2.5 and 1.5% (values included); white = events that happen with frequency lower than 1.5%.

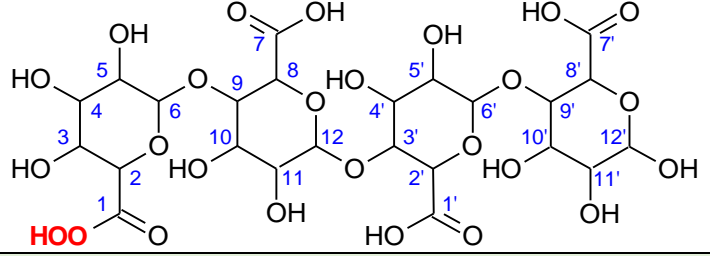
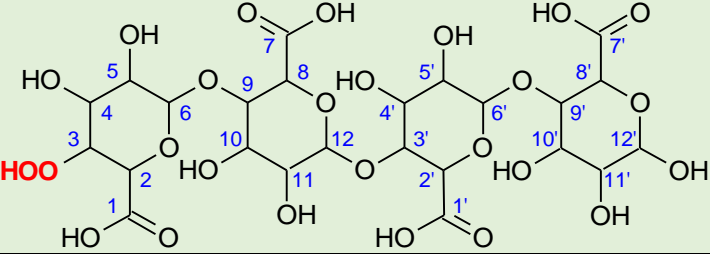
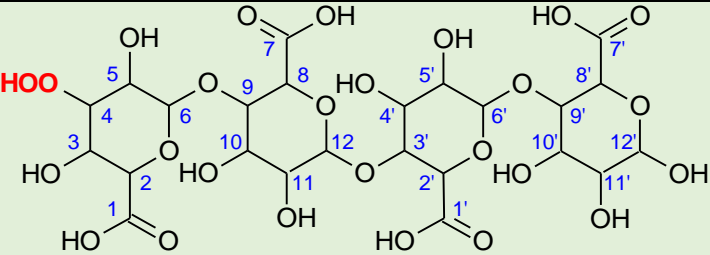
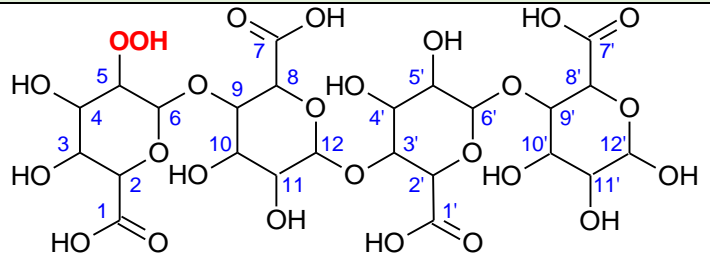
No.	H-abstraction	Number of events	Description	Structure	%
1	C <sub>2</sub> H	5	C <sub>2</sub> -OH is formed α-hydroxy acid C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		2.5
2	C <sub>2</sub> H	4	C <sub>2'</sub> -OH is formed α-hydroxy acid C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		2.0
3	C <sub>8</sub> H	1	C <sub>8</sub> -OH is formed α-hydroxy acid C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		0.5

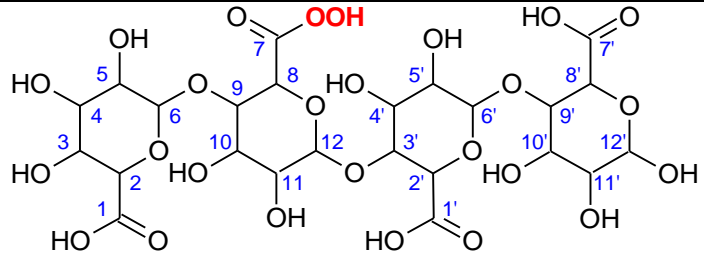
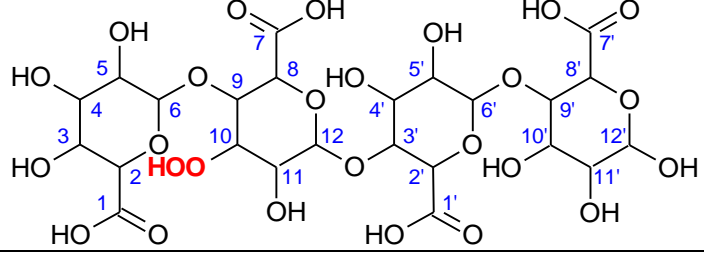
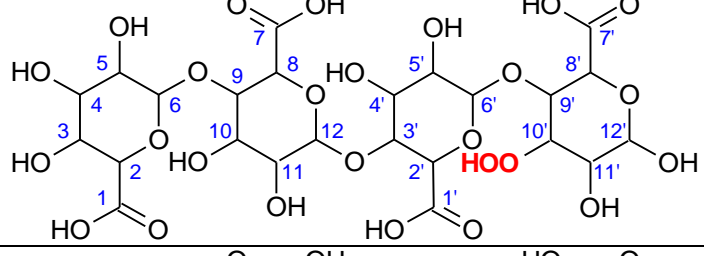
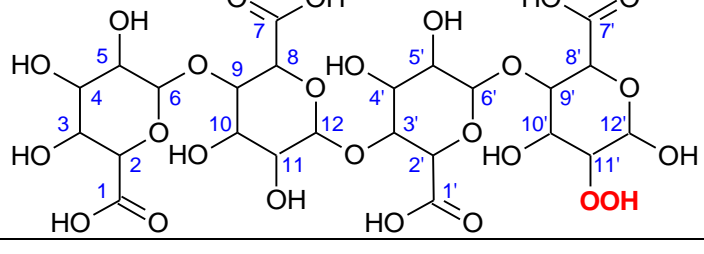
4	C <sub>8</sub> H	2	<p>C<sub>8'</sub>-OH is formed α-hydroxy acid</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.0
5	C <sub>3</sub> H	2	<p>C<sub>3'</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.0
6	C <sub>6</sub> H	4	<p>C<sub>6</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		2.0
7	C <sub>6</sub> H	2	<p>C<sub>6'</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.0

8	C <sub>9</sub> H	1	<p>C<sub>9</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		0.5
9	C <sub>12</sub> H	4	<p>C<sub>12</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		2.0
10	C <sub>3</sub> H	6	<p>C<sub>3</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		3.0
11	C <sub>4</sub> H	6	<p>C<sub>4</sub>-OH is formed geminal diol</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		3.0

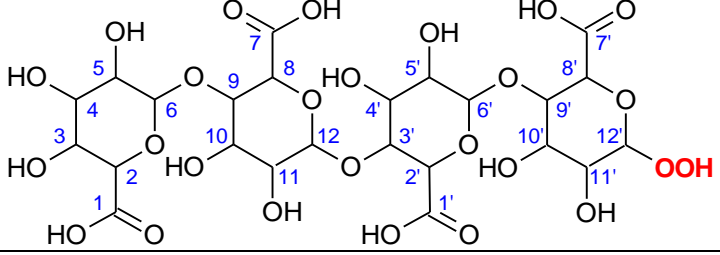
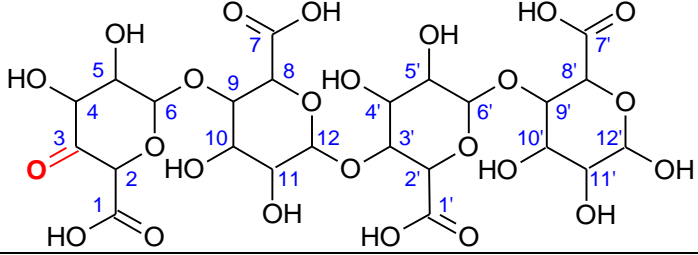
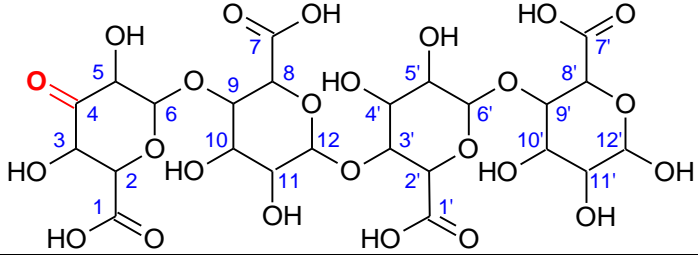
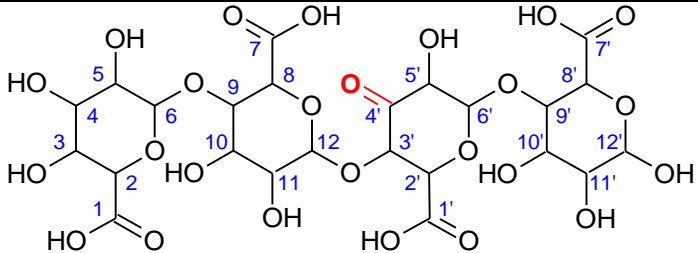
12	$C_5H$	3	$C_5-OH$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		1.5
13	$C_4H$	5	$C_4'-OH$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		2.5
14	$C_5H$	8	$C_{5'}-OH$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		4.0
15	$C_{10}H$	4	$C_{10}-OH$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		2.0

16	$C_{10}H$	7	$C_{10}'\text{-OH}$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		3.5
17	$C_{11}H$	2	$C_{11}\text{-OH}$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		1.0
18	$C_{11}H$	4	$C_{11}'\text{-OH}$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		2.0
19	$C_{12}H$	7	$C_{12}'\text{-OH}$ is formed geminal diol  $C_{24}H_{34}O_{26}$ (738 Da)		3.5

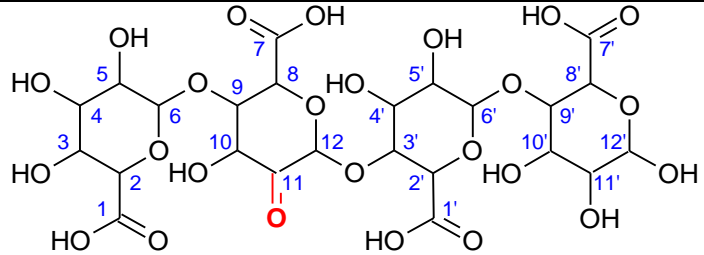
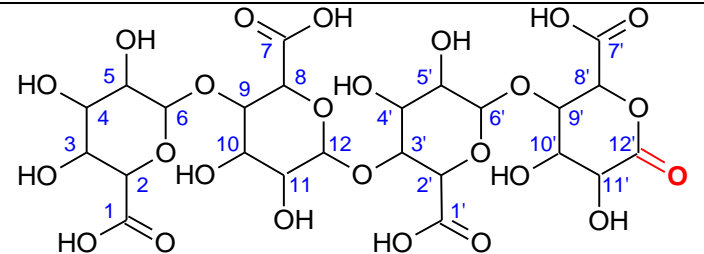
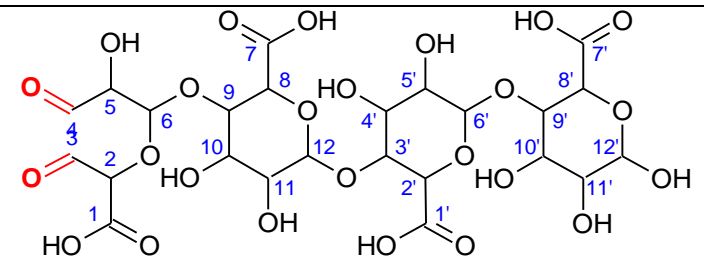
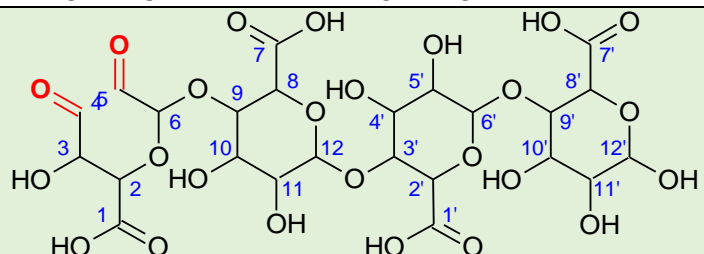
20	C <sub>1</sub> OH	1	<p>C<sub>1</sub>O-OH is formed peroxyacid</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		0.5
21	C <sub>3</sub> OH	8	<p>C<sub>3</sub>O-OH is formed hydroperoxide</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		4.0
22	C <sub>4</sub> OH	9	<p>C<sub>4</sub>O-OH is formed hydroperoxide</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		4.5
23	C <sub>5</sub> OH	2	<p>C<sub>5</sub>O-OH is formed hydroperoxide</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.0

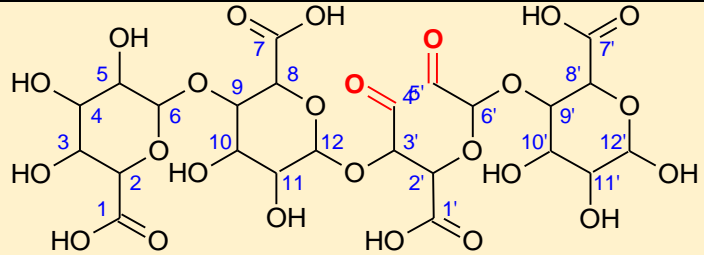
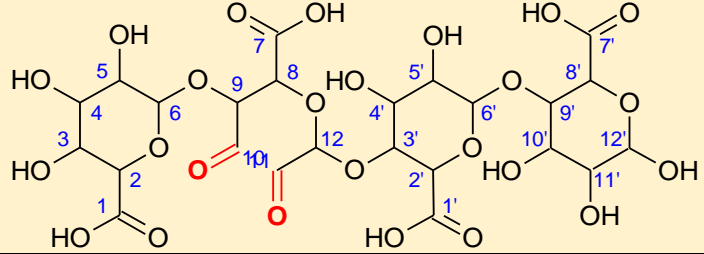
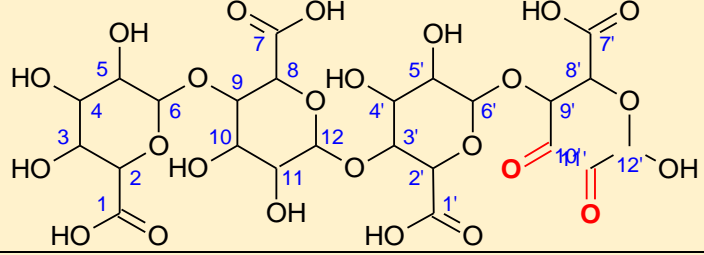
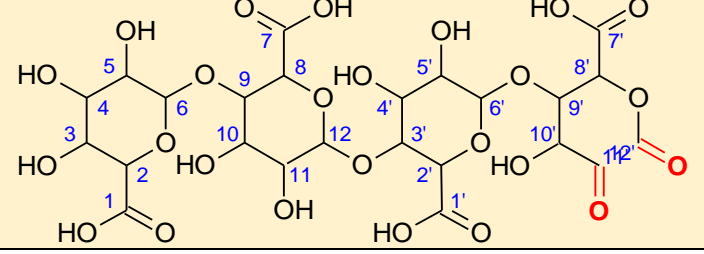
24	C <sub>7</sub> OH	1	<p>C<sub>7</sub>O-OH is formed peroxyacid</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		0.5
25	C <sub>10</sub> OH	1	<p>C<sub>10</sub>O-OH is formed hydroperoxide</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		0.5
26	C <sub>10</sub> OH	2	<p>C<sub>10</sub>O-OH is formed hydroperoxide</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.0
27	C <sub>11</sub> OH	2	<p>C<sub>11</sub>O-OH is formed hydroperoxide</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.0

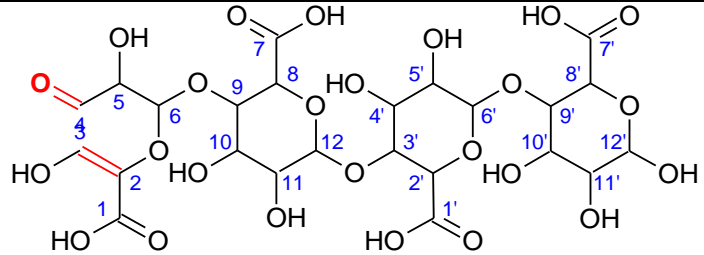
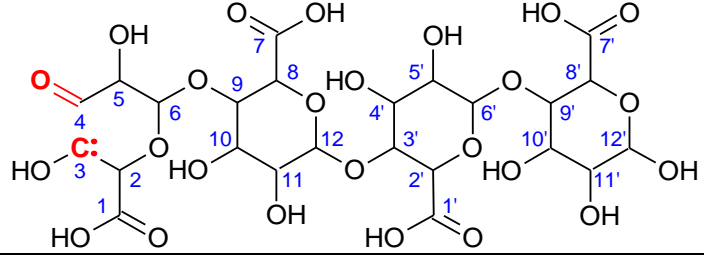
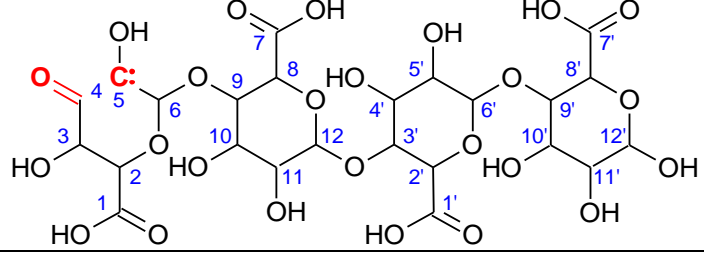
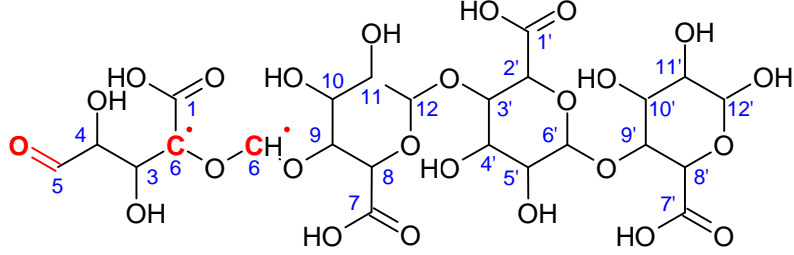


28	$C_{12}OH$	1	$C_{12}O-OH$ is formed hydroperoxide  $C_{24}H_{34}O_{26}$ (738 Da)		0.5
29	$C_3H$ and $C_3OH$	1	$H_2O$ and $C_3=O$ is formed ketone group  $C_{24}H_{32}O_{25}$ (720 Da) + $H_2O$ (18 Da)		0.5
30	$C_4H$ and $C_4OH$	1	$H_2O$ and $C_4=O$ is formed ketone group  $C_{24}H_{32}O_{25}$ (720 Da) + $H_2O$ (18 Da)		0.5
31	$C_4H$ and $C_4OH$	1	$H_2O$ and $C_4=O$ is formed ketone group  $C_{24}H_{32}O_{25}$ (720 Da) + $H_2O$ (18 Da)		0.5

32	C <sub>5</sub> H and C <sub>5</sub> OH	1	H <sub>2</sub> O and C <sub>5</sub> =O is ketone group C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
33	C <sub>5</sub> H and C <sub>5</sub> OH	3	H <sub>2</sub> O and C <sub>5</sub> =O is formed ketone group C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		1.5
34	C <sub>10</sub> H and C <sub>10</sub> OH	1	H <sub>2</sub> O and C <sub>10</sub> =O is formed ketone group C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
35	C <sub>10</sub> H and C <sub>10</sub> OH	1	H <sub>2</sub> O and C <sub>10</sub> =O is formed ketone group C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5

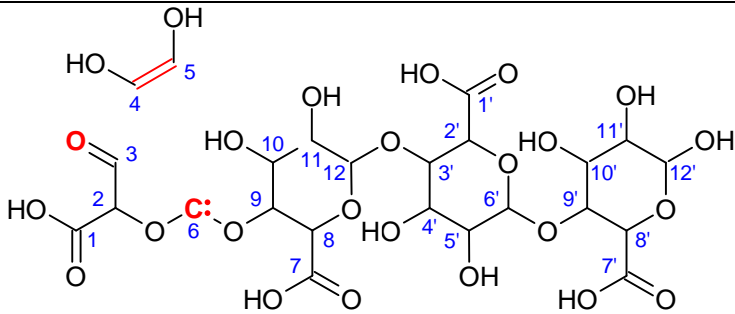
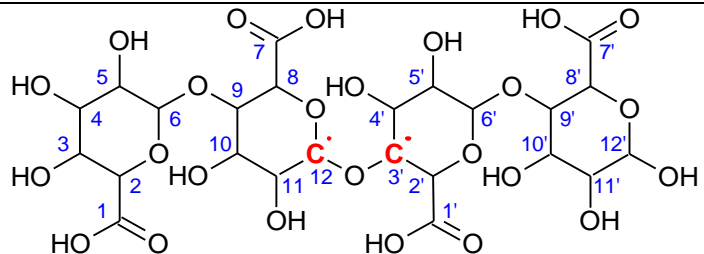
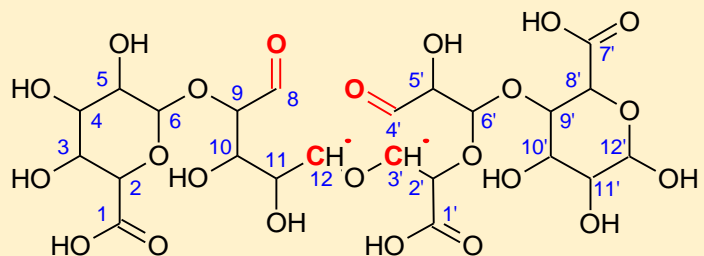
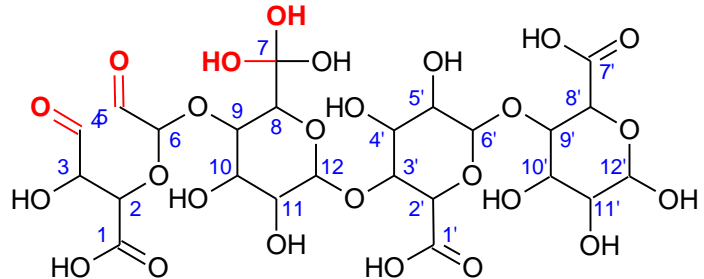
36	$C_{11}H$ and $C_{11}OH$	1	<p><math>H_2O</math> and <math>C_{11}=O</math> is formed ketone group</p> <p><math>C_{24}H_{32}O_{25}</math> (720 Da) + <math>H_2O</math> (18 Da)</p>		0.5
37	$C_{12}H$ and $C_{12}OH$	2	<p><math>H_2O</math> and <math>C_{12}=O</math> is formed ketone group</p> <p><math>C_{24}H_{32}O_{25}</math> (720 Da) + <math>H_2O</math> (18 Da)</p>		1.0
38	$C_3OH$ and $C_4OH$	2	<p><math>C_3-C_4</math> bond is broken, <math>H_2O</math>, <math>C_3=O</math> and <math>C_4=O</math> are formed 2 aldehyde groups, ring 1 opening</p> <p><math>C_{24}H_{32}O_{25}</math> (720 Da) + <math>H_2O</math> (18 Da)</p>		1.0
39	$C_4OH$ and $C_5OH$	8	<p><math>C_4-C_5</math> bond is broken, <math>H_2O</math>, <math>C_4=O</math> and <math>C_5=O</math> are formed 2 aldehyde groups, ring 1 opening</p> <p><math>C_{24}H_{32}O_{25}</math> (720 Da) + <math>H_2O</math> (18 Da)</p>		4.0

40	C <sub>4</sub> H and C <sub>5</sub> OH	3	<p>C<sub>4</sub>'-C<sub>5</sub>' bond is broken, H<sub>2</sub>O, C<sub>4</sub>'=O and C<sub>5</sub>'=O are formed</p> <p>2 aldehyde groups, ring 3 opening</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		1.5
41	C <sub>10</sub> OH and C <sub>11</sub> OH	3	<p>C<sub>10</sub>-C<sub>11</sub> bond is broken, H<sub>2</sub>O, C<sub>10</sub>=O and C<sub>11</sub>=O are formed</p> <p>2 aldehyde groups, ring 2 opening</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		1.5
42	C <sub>10</sub> 'H and C <sub>11</sub> 'OH	3	<p>C<sub>10</sub>'-C<sub>11</sub>' bond is broken, H<sub>2</sub>O, C<sub>10</sub>'=O and C<sub>11</sub>'=O are formed</p> <p>2 aldehyde groups, ring 4 opening</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		1.5
43	C <sub>11</sub> 'H and C <sub>12</sub> 'OH	5	<p>C<sub>11</sub>'-C<sub>12</sub>' bond is broken, H<sub>2</sub>O, C<sub>11</sub>'=O and C<sub>12</sub>'=O are formed</p> <p>2 aldehyde groups, ring 4 opening</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		2.5

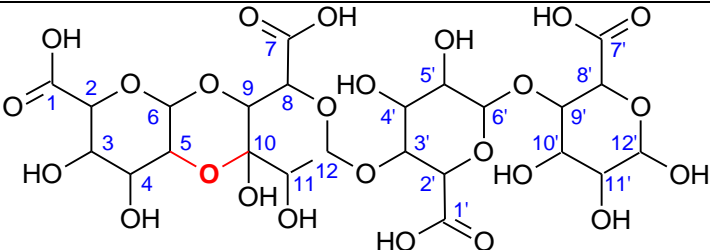
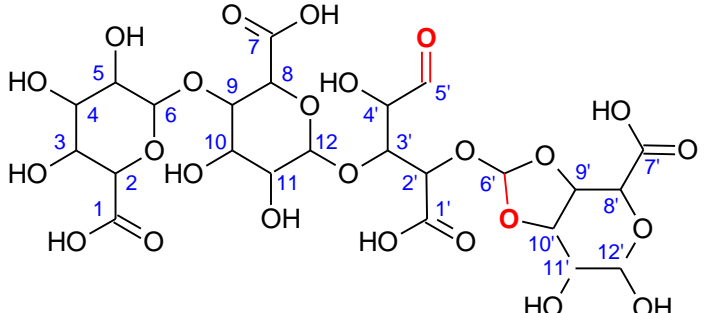
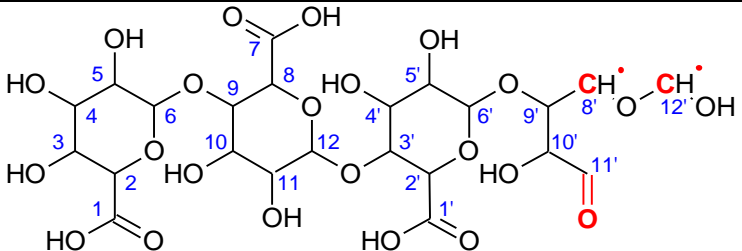
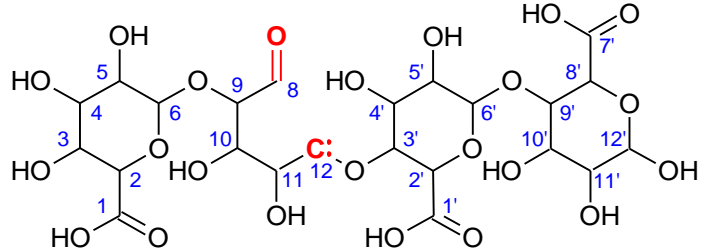
44	C <sub>2</sub> H and C <sub>4</sub> OH	1	H <sub>2</sub> O is formed, C <sub>3</sub> -C <sub>4</sub> bond is broken, C <sub>2</sub> =C <sub>3</sub> is formed aldehyde group, ring 1 opening  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
45	C <sub>3</sub> H and C <sub>4</sub> OH	1	H <sub>2</sub> O is formed, C <sub>3</sub> -C <sub>4</sub> bond is broken aldehyde and carbene C <sub>2</sub> -( $\cdot$ C <sub>3</sub> )-O formation, ring 1 opening  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
46	C <sub>4</sub> OH and C <sub>5</sub> H	1	H <sub>2</sub> O is formed, C <sub>4</sub> -C <sub>5</sub> bond is broken aldehyde and carbene C <sub>6</sub> -( $\cdot$ C <sub>5</sub> )-O formation, ring 1 opening  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
47	C <sub>2</sub> H and C <sub>5</sub> OH	1	H <sub>2</sub> O is formed, C <sub>5</sub> -C <sub>6</sub> bond is broken, C <sub>5</sub> =O, $\cdot$ C <sub>2</sub> and $\cdot$ C <sub>6</sub> are formed aldehyde group, ring 1 opening  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5

48	C <sub>12</sub> 'OH	3	<p>C<sub>8</sub>'O-C<sub>12</sub>' bond is broken, C<sub>8</sub>'O-OH is formed aldehyde and hydroperoxide groups, ring 4 opening</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		1.5
49	C <sub>5</sub> OH and later on C <sub>4</sub> OH	1	<p>C<sub>5</sub>-C<sub>6</sub> bond is broken, ring 1 opening, H<sub>2</sub>O is formed, C<sub>4</sub>O-C<sub>6</sub> is formed aldehyde and ether group</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		0.5
50	C <sub>5</sub> OH and later on C <sub>4</sub> OH	1	<p>C<sub>5</sub>-C<sub>6</sub> bond is broken (aldehyde formation), ring 1 opening, C<sub>5</sub>O-C<sub>6</sub> and C<sub>4</sub>O-C<sub>5</sub> are formed</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		0.5
51	C <sub>1</sub> OH and C <sub>2</sub> H	2	<p>H<sub>2</sub>O formation and CO<sub>2</sub> liberation, carbene C<sub>3</sub>=C<sub>2</sub> formation</p> <p>C<sub>23</sub>H<sub>32</sub>O<sub>23</sub> (676 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		1.0

52	C <sub>1</sub> OH and C <sub>6</sub> H	1	<p>CO<sub>2</sub> liberation, H<sub>2</sub>O formation, •C<sub>2</sub> and •C<sub>6</sub> formation</p> <p>C<sub>23</sub>H<sub>32</sub>O<sub>23</sub> (676 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		0.5
53	C <sub>1</sub> OH and later on C <sub>10</sub> OH	2	<p>H-abs. from C<sub>1</sub>OH: CO<sub>2</sub> liberation, C<sub>2</sub>O-C<sub>6</sub> bond breaking, ring 1 opening (aldehyde form.), C<sub>5</sub>=C<sub>6</sub> and C<sub>8</sub>=C<sub>9</sub> formation, C<sub>4</sub>-C<sub>5</sub> and C<sub>8</sub>-OC<sub>12</sub> bonds breaking, H-transfer from C<sub>4</sub>OH to C<sub>12</sub>O• (aldehyde form.)</p> <p>C<sub>15</sub>H<sub>22</sub>O<sub>16</sub> (458 Da) + C<sub>5</sub>H<sub>6</sub>O<sub>4</sub> (130 Da) + C<sub>3</sub>H<sub>4</sub>O<sub>3</sub> (88 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		1.0
54	C <sub>1</sub> OH and C <sub>10</sub> OH	1	<p>H<sub>2</sub>O formation, C<sub>10</sub>-C<sub>11</sub> bond breaking (ring 2 opening and aldehyde formation), C<sub>1</sub>O-C<sub>11</sub> bond formation (larger ring)</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		0.5
55	C <sub>1</sub> OH and C <sub>3</sub> OH	1	<p>H<sub>2</sub>O formation, CO<sub>2</sub> liberation, C<sub>3</sub>-C<sub>4</sub> bond breaking and C<sub>2</sub>-C<sub>4</sub> bond formation (aldehyde and small ring formation)</p> <p>C<sub>23</sub>H<sub>32</sub>O<sub>23</sub> (676 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		0.5

56	C <sub>3</sub> OH and later on C <sub>6</sub> H	1	<p>H-abs. from C<sub>3</sub>OH: C<sub>3</sub>-C<sub>4</sub> bond breaking (aldehyde formation), C<sub>4</sub>=C<sub>5</sub> double bond formation, C<sub>5</sub>-C<sub>6</sub> bond breaking,</p> <p>H-abs. from C<sub>6</sub>H: H<sub>2</sub>O formation, 1,2-ethenediol formation, O-(C<sub>6</sub>)-O formation</p> <p>C<sub>22</sub>H<sub>28</sub>O<sub>23</sub> (660 Da) + C<sub>2</sub>H<sub>4</sub>O<sub>2</sub> (60 Da) + H<sub>2</sub>O (18 Da)</p>		0.5
57	C <sub>3</sub> H and C <sub>12</sub> H	1	<p>H<sub>2</sub>O formation, 2 C radicals formation</p> <p>C<sub>24</sub>H<sub>32</sub>O<sub>25</sub> (720 Da) + H<sub>2</sub>O (18 Da)</p>		0.5
58	C <sub>7</sub> OH and later on C <sub>4</sub> OH	5	<p>H-abs. from C<sub>4</sub>'OH: C<sub>3</sub>'-C<sub>4</sub>' bond breaking (aldehyde formation and ring 3 opening)</p> <p>H-abs. from C<sub>7</sub>OH: CO<sub>2</sub> liberation, H<sub>2</sub>O formation, C<sub>8</sub>O-C<sub>12</sub> bond breaking (ring 2 opening and aldehyde formation),</p> <p>C<sub>23</sub>H<sub>32</sub>O<sub>23</sub> (676 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		2.5
59	C <sub>5</sub> OH and later on C <sub>4</sub> OH	1	<p>C<sub>7</sub>OH bond formation, H-abstraction from C<sub>4</sub>OH by C<sub>7</sub>O, C<sub>4</sub>-C<sub>5</sub> bond breaking, (ring 1 opening, aldehyde and triol formation)</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		0.5

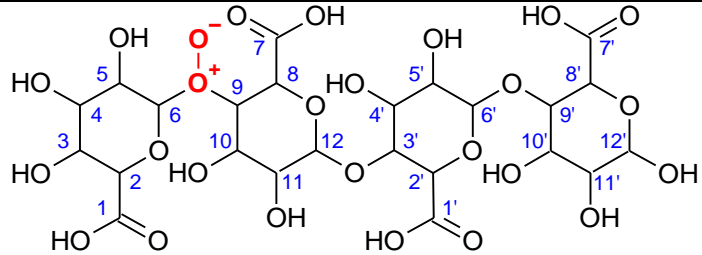
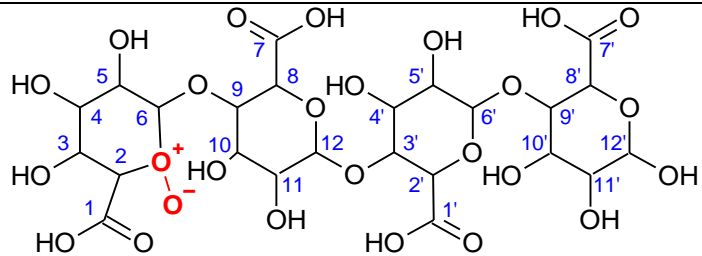
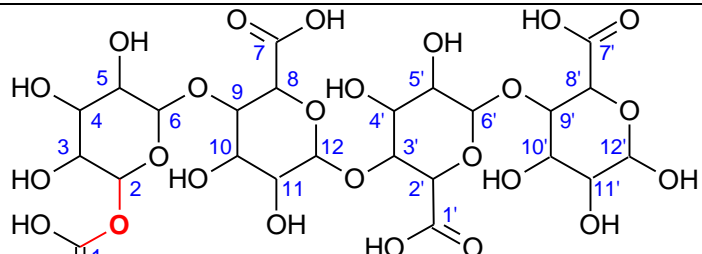
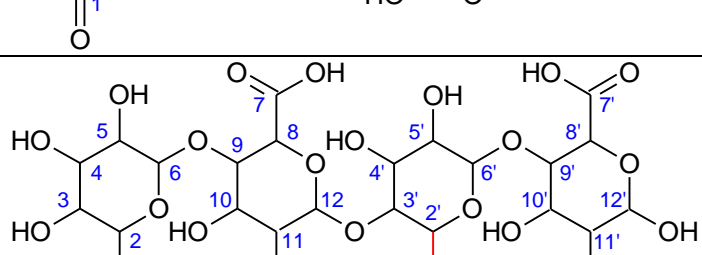


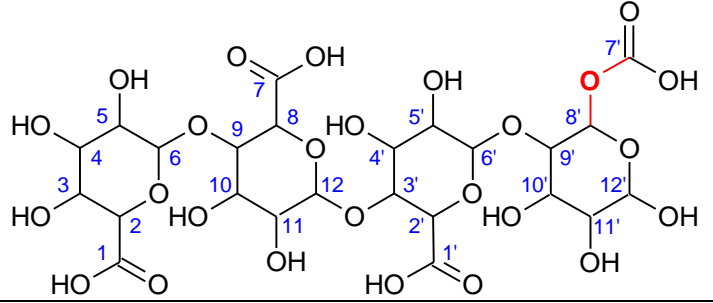
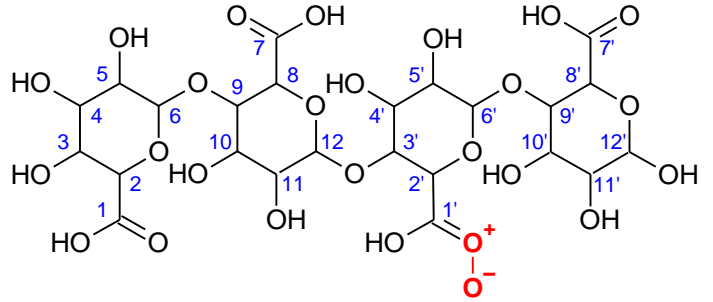
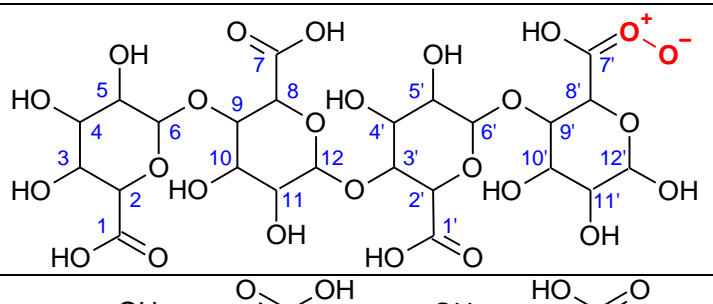
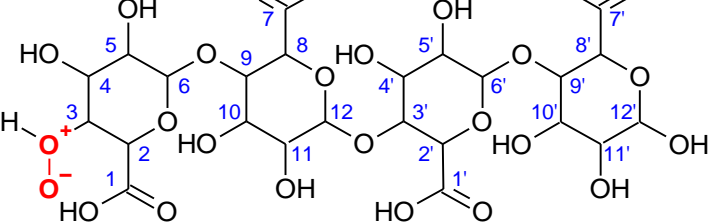
60	C <sub>5</sub> OH and C <sub>10</sub> H	1	H <sub>2</sub> O formation, C <sub>5</sub> -O-C <sub>10</sub> formation (extra ring formation)  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
61	C <sub>5</sub> OH and C <sub>10</sub> 'OH	1	H <sub>2</sub> O formation, C <sub>5</sub> '-C <sub>6</sub> ' bond breaking (ring 3 opening, aldehyde formation), C <sub>6</sub> '-O-C <sub>10</sub> ' formation (small ring formation)  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
62	C <sub>7</sub> OH and C <sub>11</sub> 'OH	2	H <sub>2</sub> O formation, CO <sub>2</sub> liberation, C <sub>11</sub> '-C <sub>12</sub> ' bond breaking (ring 4 opening and aldehyde formation), •C <sub>8</sub> ' and •C <sub>12</sub> ' formation  C <sub>23</sub> H <sub>32</sub> O <sub>23</sub> (676 Da) + H <sub>2</sub> O (18 Da) + CO <sub>2</sub> (44 Da)		1.0
63	C <sub>7</sub> OH and later on C <sub>12</sub> H	2	CO <sub>2</sub> liberation, C <sub>8</sub> O-C <sub>12</sub> bond breaking (ring 2 opening and aldehyde formation), H <sub>2</sub> O formation, :C <sub>12</sub> formation  C <sub>23</sub> H <sub>32</sub> O <sub>23</sub> (676 Da) + H <sub>2</sub> O (18 Da) + CO <sub>2</sub> (44 Da)		1.0

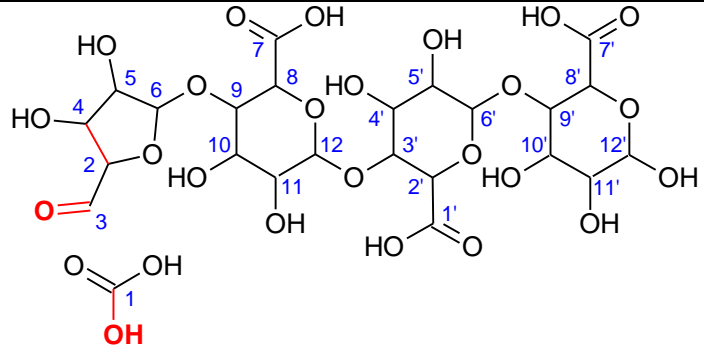
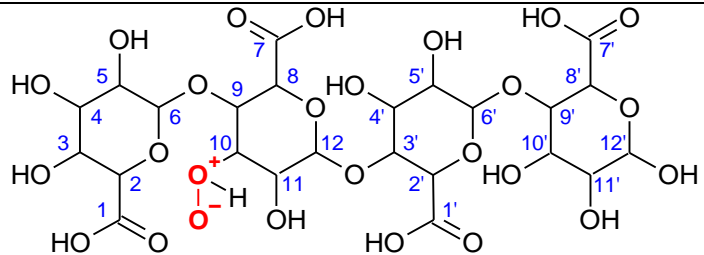
64	C <sub>7</sub> OH and C <sub>12</sub> 'OH	1	H <sub>2</sub> O formation, CO <sub>2</sub> liberation, C <sub>8</sub> 'O-C <sub>12</sub> ' bond breaking (ring 4 opening and aldehyde formation)  C <sub>23</sub> H <sub>32</sub> O <sub>23</sub> (676 Da) + H <sub>2</sub> O (18 Da) + CO <sub>2</sub> (44 Da)		0.5
65	C <sub>12</sub> 'OH and later on C <sub>7</sub> OH	1	C <sub>11</sub> '-C <sub>12</sub> ' bond breaking (ring 4 opening and aldehyde formation), H <sub>2</sub> O formation, CO <sub>2</sub> liberation, C <sub>8</sub> =C <sub>9</sub> , double bond formation and C <sub>9</sub> =C <sub>10</sub> ' breaking (1,2-ethenediol formation)  C <sub>21</sub> H <sub>28</sub> O <sub>21</sub> (616 Da) + C <sub>2</sub> H <sub>4</sub> O <sub>2</sub> (60 Da) + H <sub>2</sub> O (18 Da) + CO <sub>2</sub> (44 Da)		0.5
66	C <sub>4</sub> OH and later on C <sub>12</sub> 'OH	1	C <sub>3</sub> -C <sub>4</sub> bond breaking (ring 1 opening and aldehyde formation), H <sub>2</sub> O formation, C <sub>8</sub> 'O-C <sub>12</sub> ' bond breaking (ring 4 opening and aldehyde formation), H-transfer from C <sub>7</sub> OH to C <sub>8</sub> 'O (CO <sub>2</sub> liberation), C <sub>8</sub> '-C <sub>12</sub> ' bond formation, •C <sub>3</sub> formation  C <sub>23</sub> H <sub>32</sub> O <sub>23</sub> (676 Da) + H <sub>2</sub> O (18 Da) + CO <sub>2</sub> (44 Da)		0.5
67	C <sub>7</sub> OH and later on C <sub>1</sub> OH	2	Binding to C <sub>6</sub> -O(=O)-C <sub>9</sub> , H-abstraction from C <sub>7</sub> OH (hydroperoxyl group formation), C <sub>6</sub> -OC <sub>9</sub> glycosidic bond cleavage, H-transfer from C <sub>1</sub> OH to C <sub>7</sub> O• (CO <sub>2</sub> liberation), •C <sub>2</sub> and •C <sub>6</sub> formation  C <sub>18</sub> H <sub>26</sub> O <sub>20</sub> (562 Da) + C <sub>5</sub> H <sub>8</sub> O <sub>4</sub> (132 Da) + CO <sub>2</sub> (44 Da)		1.0

68	C <sub>1</sub> 'OH and C <sub>7</sub> 'OH	1	<p>H<sub>2</sub>O formation, 2 CO<sub>2</sub> liberation, C<sub>2</sub>'=C<sub>3</sub>' double bond formation, C<sub>12</sub>O-C<sub>3</sub>' glycosidic bond cleavage, C<sub>12</sub>O• and •C<sub>8</sub>' formation</p> <p>C<sub>12</sub>H<sub>17</sub>O<sub>13</sub> (369 Da) + C<sub>10</sub>H<sub>15</sub>O<sub>8</sub> (263 Da) + H<sub>2</sub>O (18 Da) + 2CO<sub>2</sub> (2·44 Da)</p>		0.5
69	C <sub>10</sub> 'OH and later on C <sub>1</sub> 'OH	1	<p>C<sub>9</sub>-C<sub>10</sub> bond breaking (ring 2 opening and aldehyde formation), C<sub>6</sub>-OC<sub>9</sub> glycosidic bond cleavage, H-abstraction from C<sub>1</sub>'OH (H<sub>2</sub>O formation and CO<sub>2</sub> liberation), •C<sub>2</sub> and •C<sub>6</sub> formation</p> <p>C<sub>18</sub>H<sub>24</sub>O<sub>19</sub> (544 Da) + C<sub>5</sub>H<sub>8</sub>O<sub>4</sub> (132 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		0.5
70	C <sub>4</sub> 'OH and later on C <sub>5</sub> 'OH	1	<p>C<sub>3</sub>'-C<sub>4</sub>' bond breaking (ring 3 opening and aldehyde formation), H-abstraction from C<sub>5</sub>'OH (H<sub>2</sub>O formation), C<sub>12</sub>-OC<sub>3</sub>' glycosidic bond cleavage (aldehyde formation)</p> <p>C<sub>12</sub>H<sub>15</sub>O<sub>13</sub> (367 Da) + C<sub>12</sub>H<sub>17</sub>O<sub>12</sub> (353 Da) + H<sub>2</sub>O (18 Da)</p>		0.5
71	C <sub>4</sub> 'OH and C <sub>7</sub> 'OH	4	<p>H-abs. from C<sub>4</sub>'OH: C<sub>3</sub>'-C<sub>4</sub>' bond breaking (ring 3 opening and aldehyde formation), H-abs. from C<sub>7</sub>'OH: CO<sub>2</sub> liberation, H<sub>2</sub>O formation, C<sub>8</sub>O-C<sub>12</sub> bond breaking (ring 2 opening and aldehyde formation), C<sub>2</sub>'=C<sub>3</sub>' bond formation, C<sub>2</sub>'-OC<sub>6</sub>' and C<sub>6</sub>'-OC<sub>9</sub>' bonds breaking, glycosidic bond cleavage</p> <p>C<sub>14</sub>H<sub>19</sub>O<sub>13</sub> (395 Da) + C<sub>6</sub>H<sub>9</sub>O<sub>7</sub> (193 Da) + C<sub>3</sub>H<sub>4</sub>O<sub>3</sub> (88 Da) + H<sub>2</sub>O (18 Da) + CO<sub>2</sub> (44 Da)</p>		2.0

72	C <sub>5</sub> OH and C <sub>2</sub> H	1	H <sub>2</sub> O formation, C <sub>5</sub> -C <sub>6</sub> bond breaking (ring 1 opening and aldehyde formation), •C <sub>2</sub> and •C <sub>6</sub> formation  C <sub>24</sub> H <sub>32</sub> O <sub>25</sub> (720 Da) + H <sub>2</sub> O (18 Da)		0.5
73	C <sub>5</sub> OH and later on C <sub>9</sub> H	1	C <sub>5</sub> -C <sub>6</sub> bond breaking (ring 1 opening and aldehyde formation), H-abstraction from C <sub>9</sub> H (H <sub>2</sub> O formation), C <sub>6</sub> O-C <sub>9</sub> glycosidic bond cleavage  C <sub>18</sub> H <sub>24</sub> O <sub>18</sub> (528 Da) + C <sub>6</sub> H <sub>8</sub> O <sub>7</sub> (192 Da) + H <sub>2</sub> O (18 Da)		0.5
74	C <sub>5</sub> OH and later on C <sub>11</sub> OH	1	C <sub>5</sub> '-C <sub>6</sub> ' bond breaking (ring 3 opening and aldehyde formation), H-abstraction from C <sub>11</sub> 'OH (H <sub>2</sub> O formation), C <sub>6</sub> 'O-C <sub>9</sub> ' bond breaking, C <sub>9</sub> '=C <sub>10</sub> ' double bond formation and C <sub>10</sub> '-C <sub>11</sub> ' bond breaking (glycosidic bond cleavage, ring 4 opening and aldehyde formation)  C <sub>18</sub> H <sub>24</sub> O <sub>19</sub> (544 Da) + C <sub>6</sub> H <sub>8</sub> O <sub>6</sub> (176 Da) + H <sub>2</sub> O (18 Da)		0.5
75	C <sub>8</sub> H	1	C <sub>6</sub> 'O-C <sub>9</sub> ' glycosidic bond cleavage, C <sub>8</sub> '=C <sub>9</sub> ' formation, C <sub>6</sub> 'O-OH formation  C <sub>18</sub> H <sub>26</sub> O <sub>20</sub> (562 Da) + C <sub>6</sub> H <sub>8</sub> O <sub>6</sub> (176 Da)		0.5

No.	Binding of O atom	Number of events	Description	Structure	%
76	C <sub>6</sub> -O-C <sub>9</sub>	1	Binding at C <sub>6</sub> -O-C <sub>9</sub> C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		0.5
77	C <sub>2</sub> -O-C <sub>6</sub>	1	Binding at C <sub>2</sub> -O-C <sub>6</sub> C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		0.5
78	C <sub>1</sub> -C <sub>2</sub>	1	C <sub>1</sub> -C <sub>2</sub> breaking, C <sub>1</sub> -O-C <sub>2</sub> formation C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		0.5
79	C <sub>1'</sub> -C <sub>2'</sub>	1	C <sub>1'</sub> -C <sub>2'</sub> breaking, C <sub>1'</sub> -O-C <sub>2'</sub> formation C <sub>24</sub> H <sub>34</sub> O <sub>26</sub> (738 Da)		0.5

80	$C_{7'}-C_{8'}$	1	$C_{7'}-C_{8'}$ breaking, $C_{7'}-\mathbf{O}-C_{8'}$ formation $C_{24}H_{34}O_{26}$ (738 Da)		0.5
81	$C_1\mathbf{O}$	2	$C_1\mathbf{O}-\mathbf{O}$ formation $C_{24}H_{34}O_{26}$ (738 Da)		1.0
82	$C_7\mathbf{O}$	3	$C_7\mathbf{O}-\mathbf{O}$ formation $C_{24}H_{34}O_{26}$ (738 Da)		1.5
83	$C_3\mathbf{OH}$	2	$C_3\mathbf{O}(-\mathbf{O})\mathbf{H}$ formation $C_{24}H_{34}O_{26}$ (738 Da)		1.0

84	C <sub>3</sub> OH	1	<p>C<sub>3</sub>O-<b>O</b>-C<sub>1</sub> formation, H-transfer from C<sub>3</sub>OH to C<sub>1</sub>O (diol formation), C<sub>1</sub>-C<sub>2</sub> and C<sub>1</sub>O-OC<sub>3</sub> bonds breaking (H<sub>2</sub>CO<sub>3</sub> formation), C<sub>3</sub>-C<sub>4</sub> bond breaking and C<sub>2</sub>-C<sub>4</sub> bond formation (aldehyde and small ring formation)</p> <p>C<sub>23</sub>H<sub>32</sub>O<sub>23</sub> (676 Da) + CH<sub>2</sub>O<sub>3</sub> (62 Da)</p>		0.5
85	C <sub>10</sub> OH	1	<p>C<sub>10</sub>O(-<b>O</b>)H formation</p> <p>C<sub>24</sub>H<sub>34</sub>O<sub>26</sub> (738 Da)</p>		0.5
<b>Total</b>		<b>200</b>			<b>100</b>