

Figure 1

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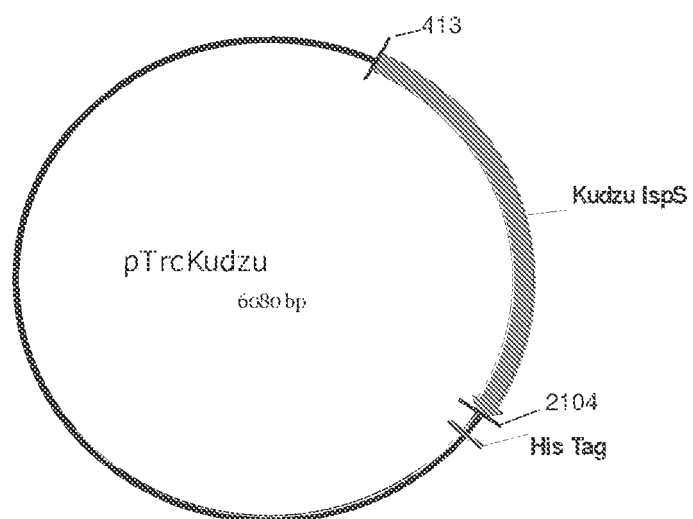


Figure 3B

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Figure 3C

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Figure 4

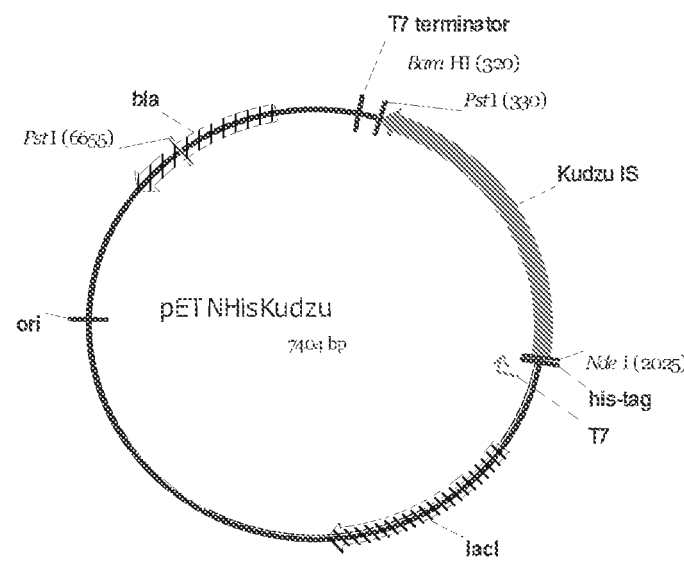


Figure 5B

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Figure 5C

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Figure 6

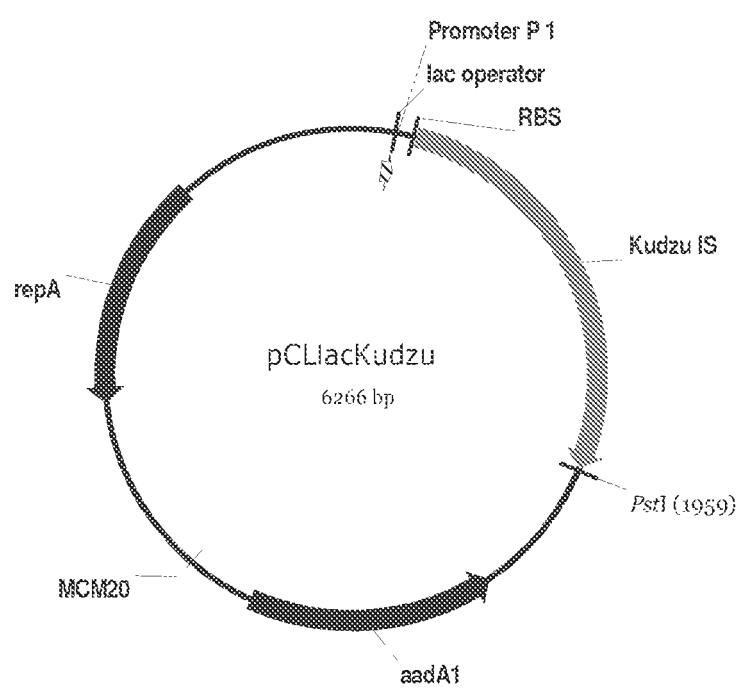


Figure 7A

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Figure 7B

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Figure 7C

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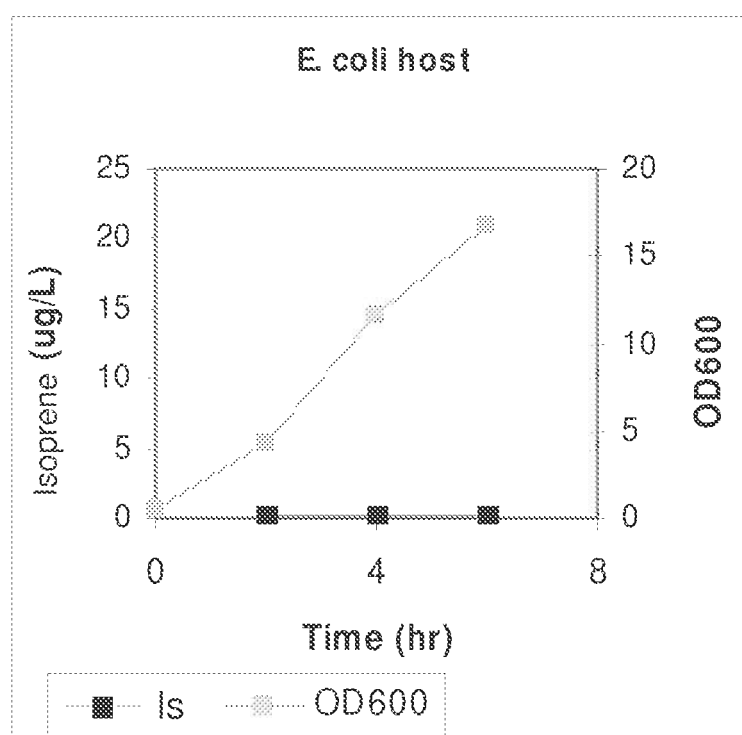


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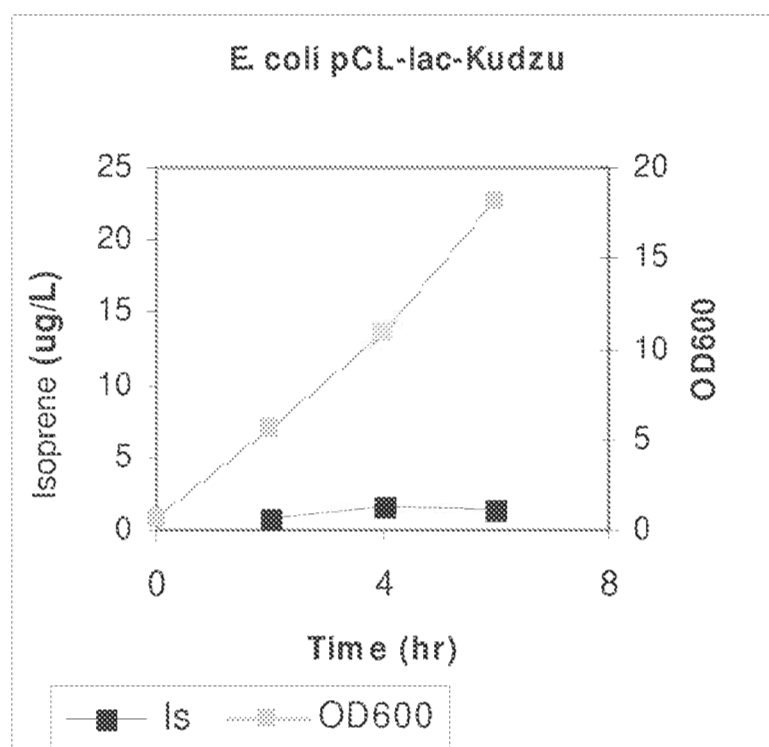


Figure 8C

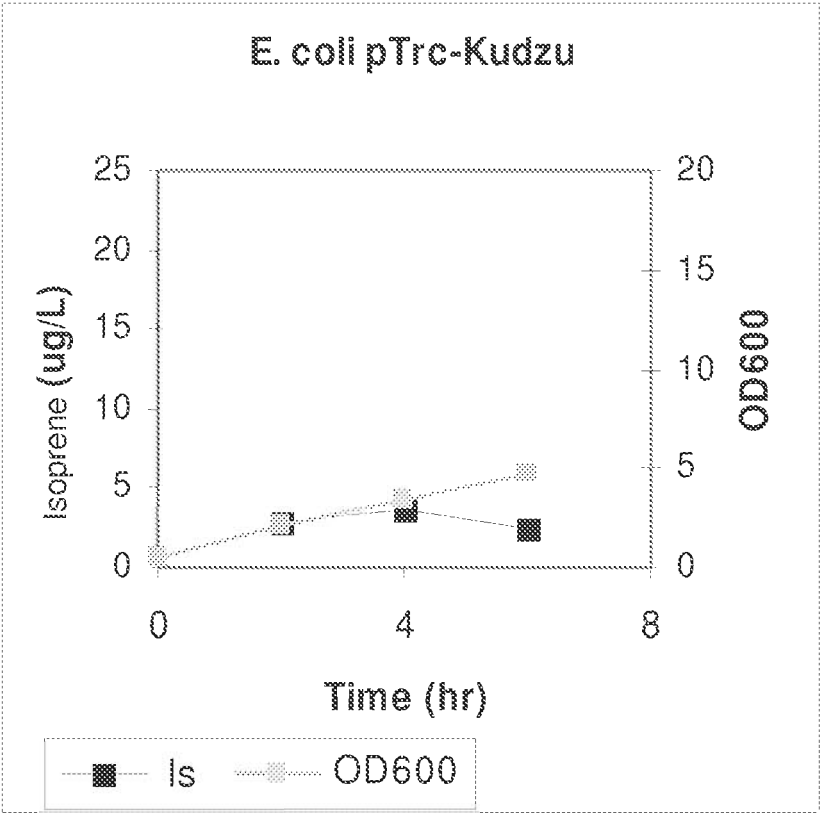


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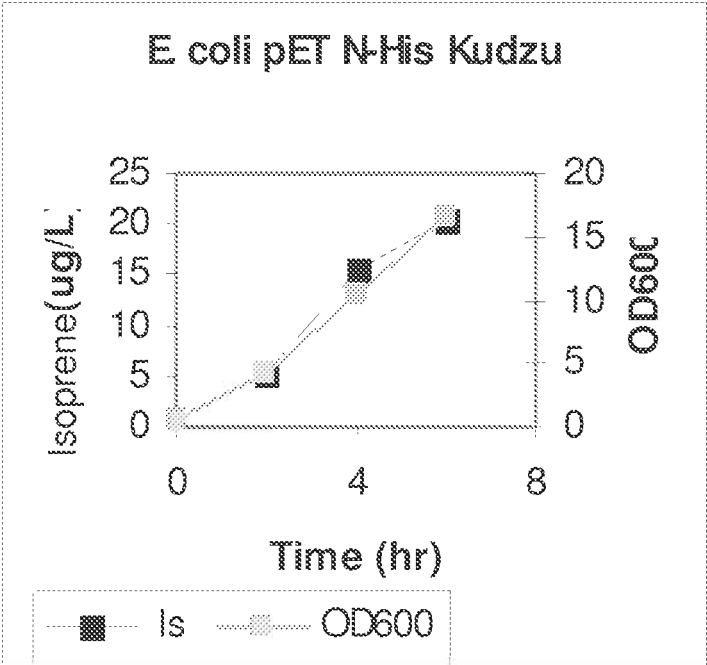


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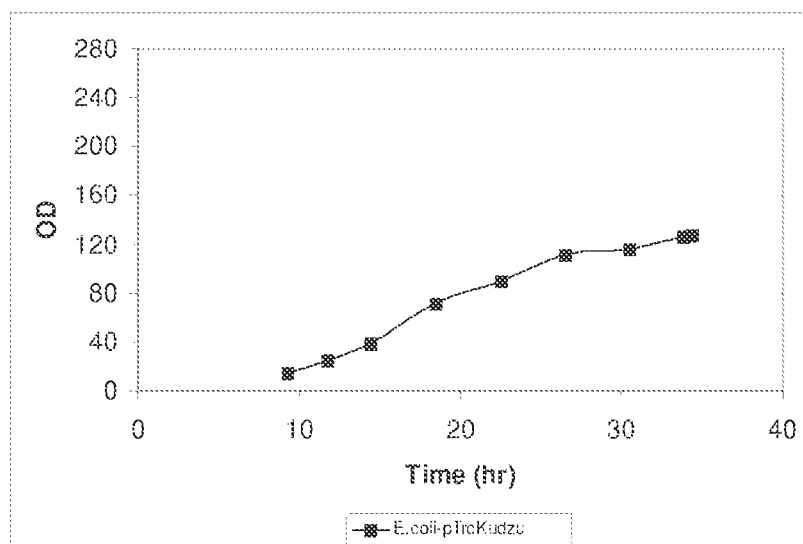


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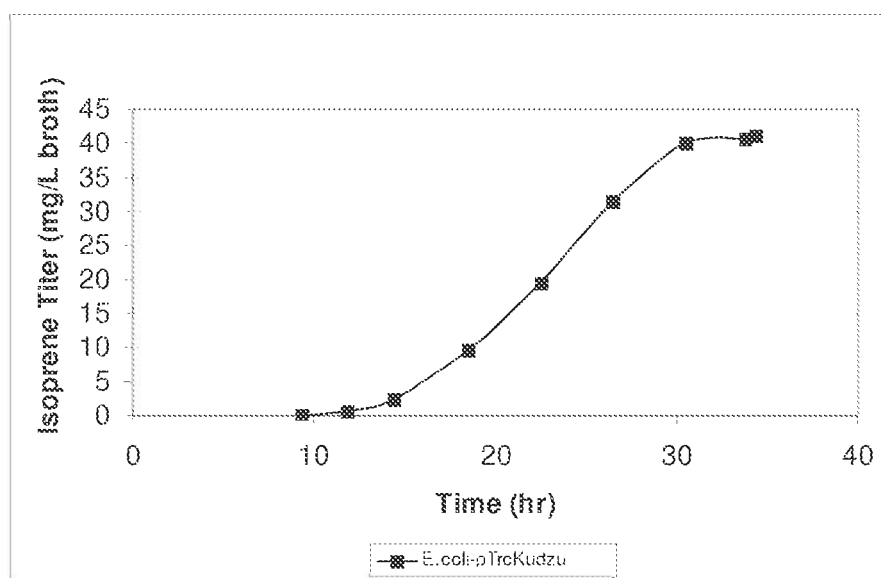


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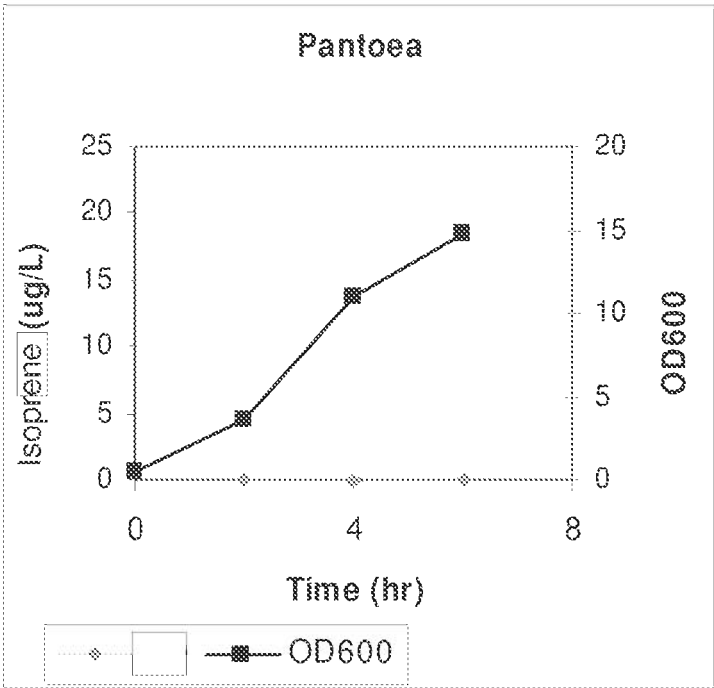


Figure 10B

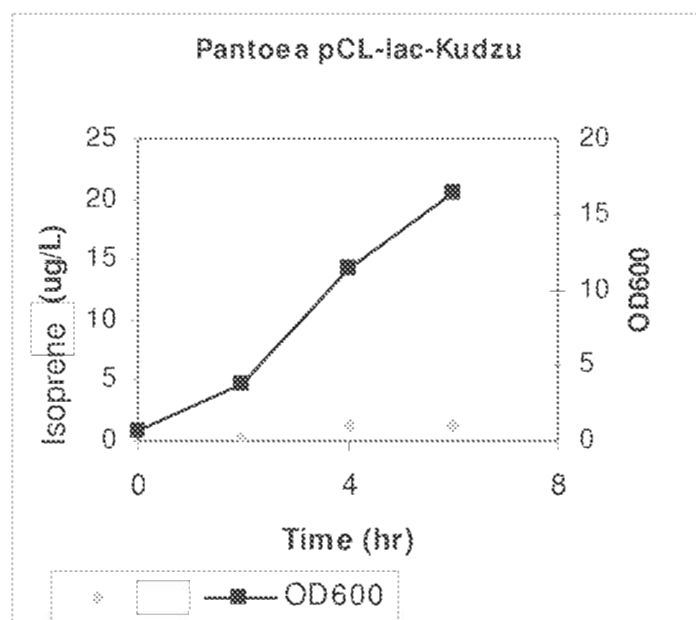


Figure 10C

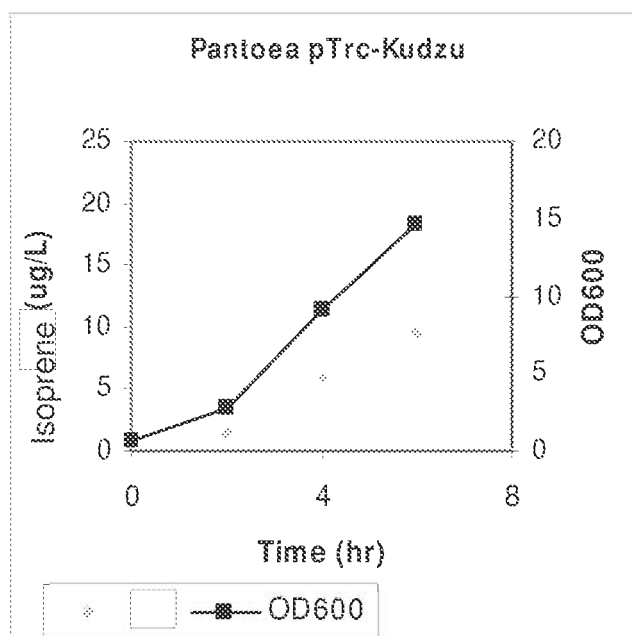


Figure 11

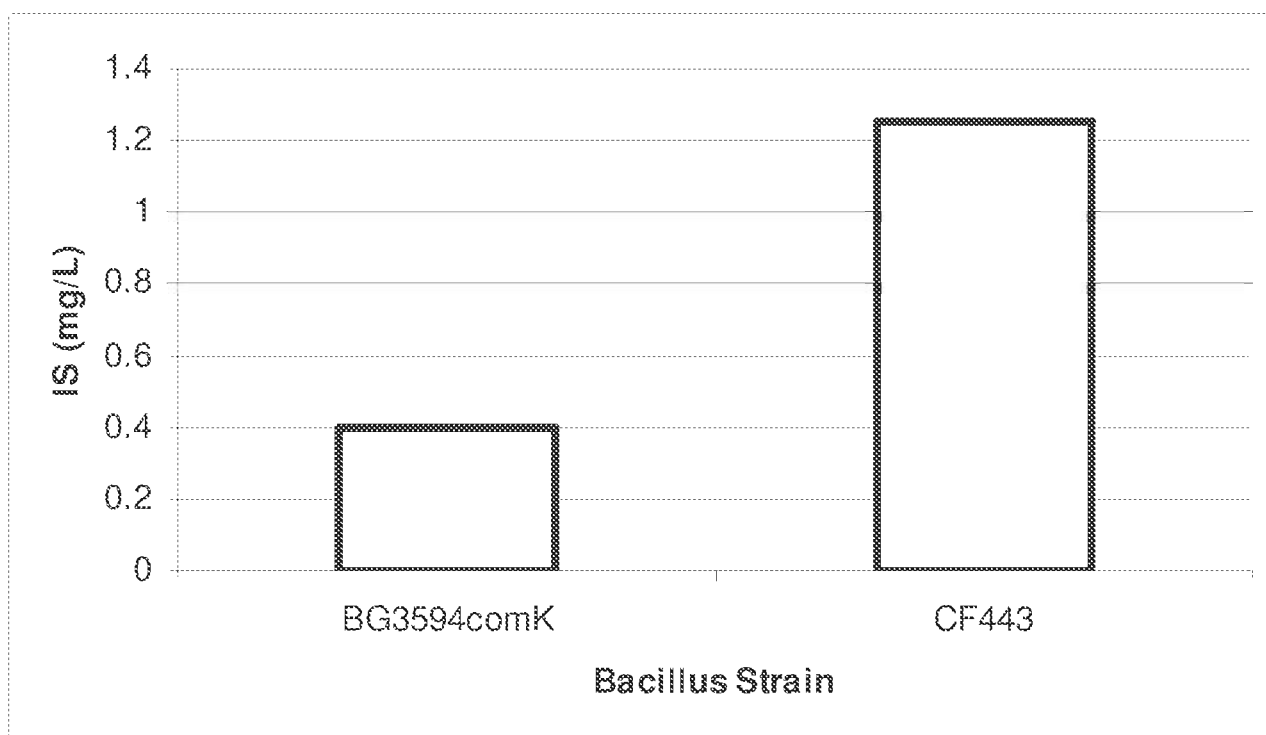


Figure 12A

1-

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cgtcagggcgcgctcagcgggtgttggcggtgtcggggcgagccatgacctagtcagtagcgata

Figure 12B

g c g g a g i g t a t a c t g g c t a a c t a t g c g g c a t c a g a g c a g a t t g t a c t g a g a g t g c a c c a t a t g c g g t g t
g a a a t a c c g c a c a g a t g c g t a a g g a g a a a a t a c c g c a t c a g g c g c t c t t c c g c t t c c t c g c t a c t g a
c t c g c t g c g c t c g g t c g g t c g g c t g c g g c g a g c g g t a t c a g c t c a c t c a a a g g c g g t a a t a c g g t i a t c c
a c a g a a t c a g g g g a t a a c g c a g g a a a g a a c a t g t g a g c a a a a g g c c a g c a a a a g g c c a g g a a c
c g t a a a a a g g c c g c g t g c t g g c g t t t t c c a t a g g c t c c g c c c c c c t g a c g a g c a t c a c a a a a t c g a
c g c t c a a g t c a g a g g t g g c g a a a c c c g a c a g g a c t a t a a a g a t a c c a g g c g t t t c c c c c t g g a a g c t
c c c t c g t g c g c t c t c t g t t c c g a c c c t g c c g c t t a c c g g a t a c c t g t c c g c c t t t c c c c t c g g g a a g c g
g g c g c t t t c t c a a t g c t c a g c t g t a g g t a t c t c a g t t c g g t g t a g g t c g t t c g c t c c a a g c t g g g c t g t g t g
c a c g a a c c c c c c g t c a g c c c g a c c g c t g c g c c t a t c c g g t a a c t a t c g t c t t g a g t c c a a c c c g g t a
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a g c g g t g g t t t t t g t t g c a a g c a g c a g a t t a c g c g c a g a a a a a a g g a t c t c a a g a a g a t c c t t t g a t
c t t t t c a c g g g t c t g a c g c t c a g t g g a a c g a a a a c t c a c g t t a a g g g a t t t t g g t c a t g a g a t t a t c a a
a a a g g a t c g a a g t c g g t t c a g a a a a a g a a g g a t a t g g a t c t g g a g c t g t a a t a t a a a a a c c t t c t t c a a
c t a a c g g g g c a g g t a g t g a c a t t a g a a a a c c g a c t g t a a a a g t a c a g t c g g c a t t a t c t c a t a t t a t a
a a a g c c a g t c a t t a g g c c t a t c t g a c a a t t c t g a a t a g a g t t c a t a a a c a a t c c t g c a t g a t a a c c a t c
a c a a a c a g a a t g a t g t a c c t g t a a a g a t a g c g g t a a a l a t a t g a a t t a c c t t t a t a a t g a a t t t c c t g c t
g t a a t a i g g g t a g a a g g t a a t t a c t a t t a t t g a t a t t t a a g t a a a c c c a g t a a a t g a a g t c c a t g g a
t a a t a g a a a g a g a a a a a g c a t t t c a g g i a t a g g t g t t t t g g g a a c a a t t t a a a a g a a c c a t t a t a t t t
c t c t a c a t c a g a a a g g t a a a t c a t a a a a c t c t t t g a a g t c a t t c t t t a c a g g a g t c c a a a t a c c a g a g
a a t g t t t t a g a t a c a c c a t c a a a a a t t g t a a a g t g g c t c t a a c t t a t c c c a a t a a c c t a a c t c t c c g t c g
c t a t t g t a a c c a g t t c t a a a a g c t g a t t t g a g t t a t c a c c c t t g t c a t a a g a a a a t a a a t g c a g g g t a a
a a t t t a t a t c c t t c t g t t a t g t t c g g t a t a a a c a c t a a t a t c a a t t t c t g t g g t t a c t a a a a g t c g t t g t
g g t c a a a t a a t g a t t a a a t a t c t c t t t c t c t c c a a t t g t c t a a a t c a a t t t t a a a g t c a t t t g a t a t g c c t
c c t a a a t t t t a t c t a a a g t g a a t t a g g a g g c t a c t t g t c t g c t t t c t c a t t a g a a t c a a t c c t t t t t a a a g t c
a a t a t t a c t g t a a c a t a a a t a t a t t t t a a a a t a t c c c a c t t a t c c a a t t t c g t t g t g a a c t a a t g g g t g
c t t a g i l g a a g a a t a a a g a c c a c a t t a a a a a t g l g g t c t t t g l g t t t t t a a a g g a l t g a g c g t a c g c g
a a a a a t c c t t t t c t t c t t c t t a l c t l g a t a a a a g g g t a a c t a t i g c c g g t g t c c a l t c a l g g c t g a a c t c g c
t c c t c t g t g a c a t g a c a c a c a t c a t c a a l a l c c g a a t a g g g c c c a l c a g t c t g a c g a c c a a g a g a g
c c a l a a a c a c c a a l a g c c t a a c a l c a l c c c c a l a t t a t c c a a t a t c g t t c c t t a a t t c a l g a a c a a l c t
c a t i c t t t c t i c l a g t c a t t a l t a t t g g l o c a t t c a c l a l l c a l l c c c t t t c a g a t a a l t t a g a t t i g c t i t t c t a
a a t a a g a a t a t i l g g a g a g c a c c g t t c l a l l c a g c l a l a a t a a c t o g t c t t c c l a a g c a l c c t t c a a t c c t t l
l a a t a a c a a l l a g c a t c l a a l c t t c a a c a a a c l g g c c c g t i l g l g a a c i a c t c t t t a a t a a a a a a a t t t t c
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a c g g t g l a a a c c t t c c c c a a a t c a g a c a a a c g t t t c a a a t c t t t c i l c a l c a t c g g t c a t a a a a t c c g t a
t c c t t a c a g g a t a t t t t g a g t t c g l c a a t t g c c g a t t g t a t a t c c g a t t a t a t t t t t t t c g g t c g a a t c a t t
g a a c t t t a c a t t t g g a t c a t a g t c t a a t t t c a t t g c c t t t t t c c a a a a t t g a a t c c a t t g t t

Figure 12C

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(SEQ ID NO:57)

Figure 13

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(SEQ ID NO:8)

Figure 14

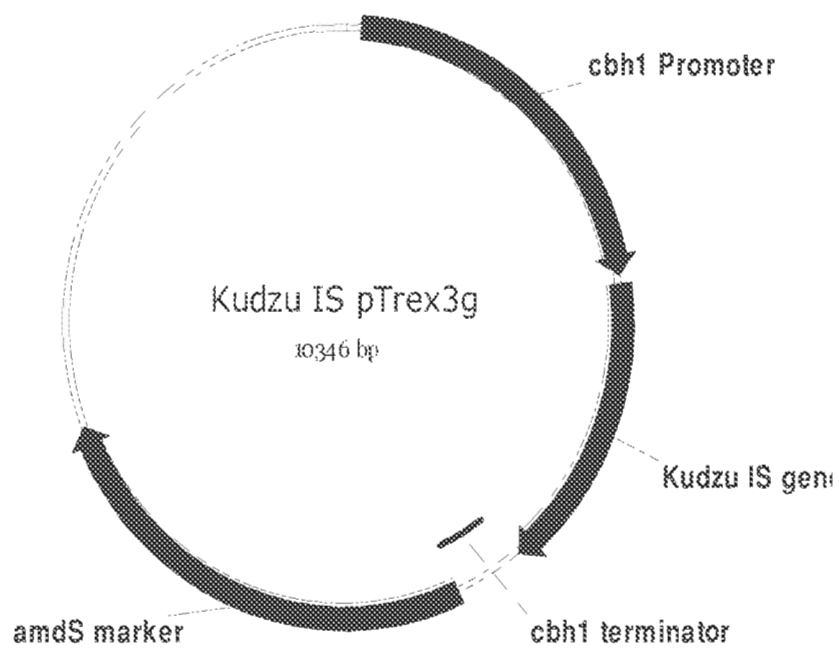


Figure 15A

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121 CTTTTCTTTT CTCTCATTCA ACGCACTCCA TCGTATCCGT ATTCCCTCTTA TTTTTCTCT
181 TTCTCTATAT CCAITTTCTT CTCTCTAGGT GTGTCTCTCT TCTCTCTTCA ATTTCTCTAC
241 TCCGCATTCC AACGCATCCF TCCCCCAACC TCCCATTTCC TCCCTACGGC CCGATAGCGA
301 TCGTCTTTCC CTCGCTATCA CTCGCTACCG GCCCCCTCTC TGCACCGTAA CCTCCTACGI
361 ATTTACCATA TCAATAAGTT TTTCCGACG CTTATCGCTG ACCCCCTGTC GCCCTCCTAT
421 TGGCTTCCGG ATTATCTTCT TGTCCATAAG GTGATCCATG CTTCCTGAAG ATTCCTGAAA
481 TGTGTCCACT TTGGCGGGGA ATCATTCCAT CCACTTCTTT CTCTCTCGCT TTCCTCATTC
541 GCGGCTCCCC TTCCGCGTCT CATTTGGTCTT CCGCTCCGTT TTGCTTTGCG CGATGTTACT
601 TGGGGAGAGG TCGGATAATC CTTCGCAAA AACTCGGTTT GACGCTCCC ATGGTATAAA
661 TGTGGGTGG TGGACAGGTG CCTTCGCTTT TCTTTAAGCA AGAGAATCCC ATTTGCTTGA
721 CTATCACGAA TPCACATACA TTAAGAAGAT CACCGCTGTC ATTGCCCTTT TATTCCTACT
781 TGTGCTGCTG TACCTATTCT CAGTTGCGCA TCTGTGTGTG GTTTCAGTTA GCAAGTCATA
841 TGTGTGATTT CTTCGTGTTT ACCAAAGTTG GAACACTTTT GCTAATCCPG ATAGACCCAA
901 CCTTAAGAAG AGAAATGATA CACCTGCAAG TGGATAFCAA GTTGAAAAAG TGTAAATTTT
961 GTCACGTGAC GGTGTTAGGG CCCCTACAAA AATGACTCAA ACCATGCGTG ATGTCACTCC
1021 TAATACATGG CCAGAATGGC CCGTAAATTT AGGATATATT ACACCAAGAG GTGAACACTT
1081 GATATCACTT ATGGGCGGTT TTTACCGTCA AAAATTCAG CAACAAGGAA TCCCTTCTCA
1141 GGGCTCCTGT CTTACTCTTA ACTCCATAAT TGTCTGGGCT GACGTGATC AGCGTACTTT
1201 AAAAAGTGGT GAAGCATTCC TTGCTGGTTT GGCACCACAA TGTGGCTTGA CAATTCATCA
1261 CCAACAAAAT CTGAGAAAG CTGATCCTCT TTTTCATCCC GTTAAAGCTG GAACCTGCTC
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1681 ATTCGATTTG ATGGCCCGAA CACCTTATAT TGCTCGACAT AACGGTACTC CTTTATTGCA
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1801 TGATAACAAA ATATTGTTCA TTGCAGGTCA TGACACAAAT ATTGCTAATA TAGCCGGCAT
1861 GTTAAATATG CGTTGGACAT TACCAGGTCA ACCAGATAAT ACTCTCCAG GTGGTGCCCT
1921 AGTATTTGAA CGTCTTGCTG ATAAAAGTGG AAAACAATAT GTTCTGTAT CTATGGTTTA
1981 TCAAACTACTA GAACAACCTC GATCACAGAC TCCCCCTTCT CTAAATCAGC CTGCCGGATC
2041 TGTTCAACTT AAAATTCAG GTTGAATGA TCAAAACAGC GAGGGTACT GTCCICTTTC
2101 CACTTTTACA AGAGTTGTTT CCCAATCTGT TGAACCTGGA TGCCAACCTC AATAATGAGG
2161 ATCCAAGTAA GGAATGAGA ATGTGATCCA CTTTAAATTC CTAATGAATA CATGCCATA
2221 GTCTTTTCTT TTTGTTCTTT ATGTGCTTTT TCGATGGTAC GGCGGTGTC AATCICAGTT
2281 TGTGTGCTTG GTTGCAGCTT GGTTCAAAT CTGTTCATCT CATGAATCTT TTACCATTTT
2341 ACCACACGTT TATACCATT CTCTATAGAA TCTTCATCAA ACCATCTCGG GGTTAGAGTG
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2641 TCTTTAATTT TCTTTCAAAG TAGTTGAGCT ATAGTTAAGT GTAAGGGGCC TACTGCGAAA
2701 GCAITTTGCC AGGATGTTTT CATTAATCAA GAACGAAAGT TAGGGGATCG AAGACGATCA
2761 GATACCGTCT TAGTCTTAAC CATAAACTAT GCCGACTAGG GATCGGGCAA TGTTCATTT
2821 ATCGACITGC TCGGCACCTT ACGAGAAATC AAAGTCTTTG GGTTCCGGGG GGAGIATGGI
2881 CGCAAGGCTG AAACCTAAAG GAATGACGG AAGGGCACCA CAATGGAGTG GAGCCTGCGG
2941 CTTAATTTGA CTCAACACGG GGAACCTCAC CAGGTCCAGA CATAGTAAGG ATTTGACAGT
3001 TGAGAGCTCT TCTTTGATTC TATGGGTGGT GGTGCATGGC CGTTCCTAGT TGTGTGAGTG
3061 ATTTGTCTGC TTAATTTGCG TAACGAACGA GACCTTAACC TGCTAAATAG CTGGATCAGC
3121 CATTTTGGCT GATCATTAGC TTCTTAGAGG GACTATTGGC ATAAAGCCAA TGAAGTTTG
3181 AGGCAATAAC AGGTCTGEGA TGGCTTAGA TGTCTGGGC CGCACGCGCG CTACACTGAC
3241 GGAGCCAAAC AGTTGAAAAA AATCTTTTGA TTTTATCC TTGGCCGGAA GGTCTGGGTA
3301 ATCTTGTTAA ACTCCGTCTG GTTGGGGAIA GAGCATTGCA ATATTGCGG CCGCTCCTCA
3361 ATTCGATGTT GCAGATTTTA CAAGTTTTTA AATGTATTTT CATTAATTTT TTTTATATGC
3421 CPAATAAAAA AGCCATAGTT TAATCTATAG ATAACTTTTT TTCCAGTGCA CTAACGGAGC

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Figure 15B

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3601 TTTACAGCGAA TTTTAAACAA ACATCGTTCA CCTCGTTTAA GGATATCTTG TGTATGGGGT
3661 GTTGACTTGC TTTATCGAAT AATTACCGTA CCGTAATTG GCTTGCTGGA TATAGCGGTA
3721 GTCTAATATC TAGCAAAAAT CTTTGGGGTG AAAAGGCTTG CAATTTACAG ACAGCGAACT
3781 AITTTGTCATT TTTTAAIAAG GAAGTTTTC ATAAATTCCT GTAATTCCTG GTTGATCTAA
3841 TTGAAAAGAG TAGTTTTGCA TCACGATGAG GAGGGCTTTT GTAGAAAGAA ATACGAACGA
3901 AACGAAAATC AGCGTTGCCA TCGCTTTGGA CAAAGCTCCC TTACCTGAAG AGTCGAATTT
3961 TATTGAIGAA CTTATAACTT CCAAGCATGC AAACCAAAAG GGAGAACAAG TAATCCAAGT
4021 AGACACGGGA ATTGGATTCT TGGATCACAT GTATCATGCA CTGGCTAAAC ATGCAAGGCTG
4081 GAGCTTACGA CTTTACTCAA GAGGTGATTT AATCATCGAT GATCATCACA CTGCAGAAGA
4141 TACTGCTATT GCACTTGGTA TTGCATTCAA GCAGGCTATG GGTAACTTTG CCGCGGTTAA
4201 AAGATTTGGA CATGCTTATT GTCACCTTGA CGAAGCTCTT CTAGAAGCG TASTTGACTT
4261 GTGGGGACGG CCTATGCTG TATCGATTT GGGATTAAAG CGTGAAAAGG TTGGGGAATT
4321 GTCTGTGTA ATGATGCCCT ACTTACTATA TTCTTTTTCG GTAGCAGCTG GAATTAATTT
4381 GCATGTTACC TCGTTATATG GTAGTAATGA CCATCATGCT GCTGAAAGCG CTTTTAAATC
4441 TGTGGCTGTT GCCATGCGCG CGGCTACTAG TCTTACTGGA AGTCTGGAAG TCCCAAGCAC
4501 GAAGGGAGTG TTGTAAAGAT GAATGGGATT ATGTCAGGAA AAGAACGACA ATTTGCAATC
4561 CAAATTGTCT AAATTTIAGA GTTGTCTGAA AACAAIAGAA CTTTACTTGC TTTATAATTA
4621 CGTTAATTAG AAGCGTTATC TCGTGAAGGA ATATAGTACG TAGCCGTATA AATTGAATTG
4681 AATGTTTACG TTATAGAATA GAGACACTTT GCTGTTCAAT GCGTCGTCAC TTACCATACT
4741 CACTTTATTA TACGACTTTA AGTATAAACT CCGCGGTTAT GGTAAAATTA ATGATGCACA
4801 AACGTCCGAT TCCATATGGG TACACTACAA TTAATACTTT TTAAGCTGAT CCCCCACACA
4861 CCATAGCTTC AAAATGTTTC TACTCTTTT TACTCTTTC AGATTTTCTC GCACTCCGCG
4921 CATCGCCGTA CCACCTTCAA ACACCCAAGC ACAGCATACT AAATTTTCCC TCTTCTTTC
4981 CTAGGGTGT CGTTAATTAC CCGTACTAAA GGTTTGGAAG AGAAAAAGAA GACCGCCTCG
5041 TTTCTTTTTC TTCTGCGAAA AAGGCAATAA AAATTTTIAT CACGTTTCTT TTTCTTGAAA
5101 TTTTTTTTTT TAGTTTTTTT CTCTTTTCA GTTCTCCATT GATATTTAAG TTAATAAACG
5161 GCTTTCATTT TCTCAAGTTT CAGTTTCAAT TTCTTTGTTT TATTACAAC TTTTTTACTT
5221 CTTGTTTATT AGAAAGAAAG CATAGCAATC TAATCTAAGG GCGGTGTGTA CAATTAATCA
5281 TCGGCATAGT ATATCGGCAT AGTATAATAC GACAAGGTGA GGAATAAAC CATGCGCAAG
5341 TTGACAGTGT CCGTTCCGGT GCTCACCCTG CCGACGCTCG CCGGAGCGGT CTAGTTCTGG
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5461 GACGACGTGA CCTGTTCAT CAGCGCGGTC CAGGACCAGG TGGTGCCTGA CAACACCCCTG
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5761 CTTGTGCGAT ATCATGTAAT TAGTTATGTC ACGCTTACAT TCACGCGCTC CCGGACATC
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6121 TCCCAAGAT CTTAGCGGG ATTTTGCCGA TTCTGGCTA AAGGAACGG AACACGTAGA
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6661 AGGCAGCGCG GCTATCGTGG CTGCGCACGA CCGGCTTCT TTGCGCAGCT GTGCTCGACG
6721 TGTCTACTGA AGCGGGAAGG GACTGGCTGC TATTGGGCGA AGTGCCTGGG CAGGATCTCC
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6901 GAGCACGTAC TCGGATGGAA GCGGCTCTG TCGATCAGGA TGATCTGAC GAAGACGATC
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Figure 15C

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7141 TGGATACCCG TGATATTGCT GAAGAGCTTG GCGGCGAATG GGCTGACCGC TTCCTCGTGC
7201 TTTACGGTAT CGCCGCTCCC GATTCGCAGC GCATCGCCTT CTATCGCCTT CTTGACGAGT
7261 TCTTCTGAAT TGAAAAAGGT ACCAAGTTTA CTCATATAIA CTTIAGATIG ATTTAAAACT
7321 PCATTTTTAA TTTAAAAGGA TCTAGGTGAA GATCCTTTTT GATAATCTCA TGACCAAAAT
7381 CCCTTAACGT GAGTTTTTCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
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7501 ACCAGCGGTG GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAACCTG
7561 CTECASCAGA GCGCAGATAC CAAATACGT CTTCTAGTG IAGCCGTAGT IAGGCCACCA
7621 CTTCAAGAAC TCTGTAGCAC CGCTACATA CTTGCTCTG CTAATCCTGT TACCAGTGGC
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(SEQ ID NO:11)

Figure 16

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1.  GAATTCAAAA CAAAATGTGT GCAACCTCCT CCCAGTTTAC TCAGATTACC GAGCATAATT
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18. GATGTATGAT CAACAGAGTT GACACCCAAC CCTGTCTTTT GCTGGAGCTG ATCGACGATG
24. TCGAGCGGTT GGGTTTGACT TATAAATTCG AGAAGGACAT TATCAAGGCA CTGGAGAACA
30. TTGTGCTCCT CGACGAGAAC AAGAAGAACA AGTCTGATCT TCACGCTACC GCTCTCTCTT
36. TCCGACTTCT TCGACAACAC GGCTTCGAGG TGTCGCAGGA CGTCTTCGAG AGATTTAAGG
42. ACAAGGAGGG AGGATTTAGC GCGGAGCTGA AGGGAGACGT TCAGGGTCIT CTCTCCTTGT
48. ACGAGGGCGTC CTACCTGGGA TTCGAGGGAG AGAACCTCCT GGAGGAAGCT CGTACATTTT
54. CCATCACICA CCITAAGAAT AACCTTAAGG AGGGAATTAA CACCAAGGTG GCGGAGCAGG
60. TTTCTCAGC CCGGAGGCTC CCTTACCACC AACGGCTCCA TAGACTGGAG GCTCGTTGGT
66. TCGTGGACAA ATATGAGCCA AAGGAGGCTC ATCATCAGTT GCTGTTGGAG TTGGCCAAGC
72. TGGACTTCAA TATGGTTTCAG ACGCTGCACC AAAAGGAGTT GCAGGACCTG TCTCGATGGT
78. GGACCGAGAT GGGATTTGGC TCGAAGCTGG ATTTTGTCCG TGACCGACTT AFGGAGGTCT
84. ATTTTGGGGC CTTTGGAAATG GCGCCTGACC CCCAGTTCCG AGAGTGGCCG AAGGCGGTGA
90. CGAAGATGTT CGGTCTTGTG ACTATCATCG ACGACGICTA CGATGTCTAC GGCACACTCG
96. ACGAGTTGCA GCTGTTCACT GACGCGCTCG AGCGATGGGA TGTGAACGCC ATTAATACTC
102. TCCCTGACTA TATGAAGCTG TGCTTCTGCG CTCGTGACAA CACTGTCAAC GATACCTCGT
108. ACTCTATCCT CAAGGAGAAG GGACACAACA ATCTCTCCTA CTTGACCAAA TCTTGGCGAG
114. AACTGTGCAA GGCTTTTCTG CAGGAGGCTA AATGGTCCAA TAACAAGATC ATTCCTGCTT
120. TTTCTAAATA CCGGAAAAAT GCCTCGGTGT CGAGCTCTGG CGTCGCCCTT CTGGCCCCCT
126. CTTACTTCTC CTTCTGCCAG CAGCAGGAGG ATATTTCCGA TCATGCTCTT AGATCGCTGA
132. CCGATTTTICA CGGCCTCGTG CGATCTTCTT GCGTGAATTT TCGTTTGTGT AATGACCTTG
138. CGACCTCTGC TGCTGAGCTG GAACGAGGCG AGACTACAAA TTCCATTATT TCTTACATGC
144. ACGAAAAACGA TGGACATCT GAAGAACAGG CTAGAGAGGA ACTGCGAAAG TTGATCGACG
150. CCGAGTGGA GAAGATGAAC AGAGAGCGGG TGTCGACTC TACCTTGCTT CCAAGGCCT
156. TCATGGAGAT CGCCGTGAAC ATGGCTCGAG TTTCCCAATT TACTTACCAG TACGGTGACG
162. GCCTGGGTCT TCCGGACTAC GCTACAGAGA ACCGAATCAA GCTGCTGCTC ATCGACCCCT
168. TCCCTATCAA CCAATTGATG TACGTGTAAT AGTCTAGAGG ATCC

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(SEQ ID NO:12)

Figure 17

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61 TGAAGCACGT AGAAGEGCCA ACTACGAACC CAACTCCTGG GATTATGACT TTCTGCTGTC
121 TCTGACACCC GACGAGTCGA TCGAGGTTTA TAAGGATAAG GCCAAGAAAC TTGAGGCCGA
181 GGTGAGACGA GAGATTAACA ACGAGAAGGC CGAGTTCCCTG ACCCTTCTTG AGCTGATCGA
241 CAACGTTCAA CGACTTGGTC TTGGTTACCG TTTCGAATCC GATATCCGAC GTGCATTGGA
301 TCGATTIGTC TCGTCCGGAG GTTTCGATGG TGTGACTAAG ACGTCGCTGC ACGCCACAGC
361 TCTTTCCCTC AGACTGTTGC GGCAGCATGG ATTTGAGGTT TCCCAGGAAG CCTTTTCTGG
421 TTTC AAGGAT CAGAACGGAA ACITTTTGGA GAATCTCAAG GAGGACACCA AGGCCATCCT
481 GTCGTTGAT GAGGCCICGT TCCTGGCTCT TGAGGGCGAG AATAITCTGG ATGAGGCTCG
541 GGTTCCTGCT ATTTCCGACC TGAAGGAGTT GTGGGAGGAA AAGATCGGAA AGGAACTGGC
601 CGAGCAGGTC AACCATGCAC TTGAACCTCC CCTGCATCGA CGTACCCAGC GACTGGAGGC
661 CGTGTGGAGC ATCGAGGCGT ACAGAAAAAA GGAGGATGCT AATCAGGTTT TGCTCGAACT
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781 CCGGTGGTGG CGACGGGTGG GACTGGCCAC GAAGCTCCAC TTGCTAAAG ATCGATTGAT
841 TGAGTCGTTT TACTGGGCAG TGGGTGTGGC CTTTGAGCCT CAGTACTCCG ACTGCCGAAA
901 CTCGGTTGCA AAGATGTTTT CTTTTGTAC TATCATCGAC GACAICTACG ATGTTTACGG
961 CACTCTCGAT GAACTCGAAC TCTTCACGGA CGCTGTGCGAG CGATGGGATG TGAATGCCAT
1021 TAATGATCTG CCAGATTATA TGAAGTTGFG TTCTTTGGCG CTCTACAACA CAATTAATGA
1081 AATTGCCTAC GACAACCTCA AGGACAAGGG AGAGAACATT CTGCCCTACC TTACTAAAGC
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(SEQ ID NO:13)

18 Aug 1994

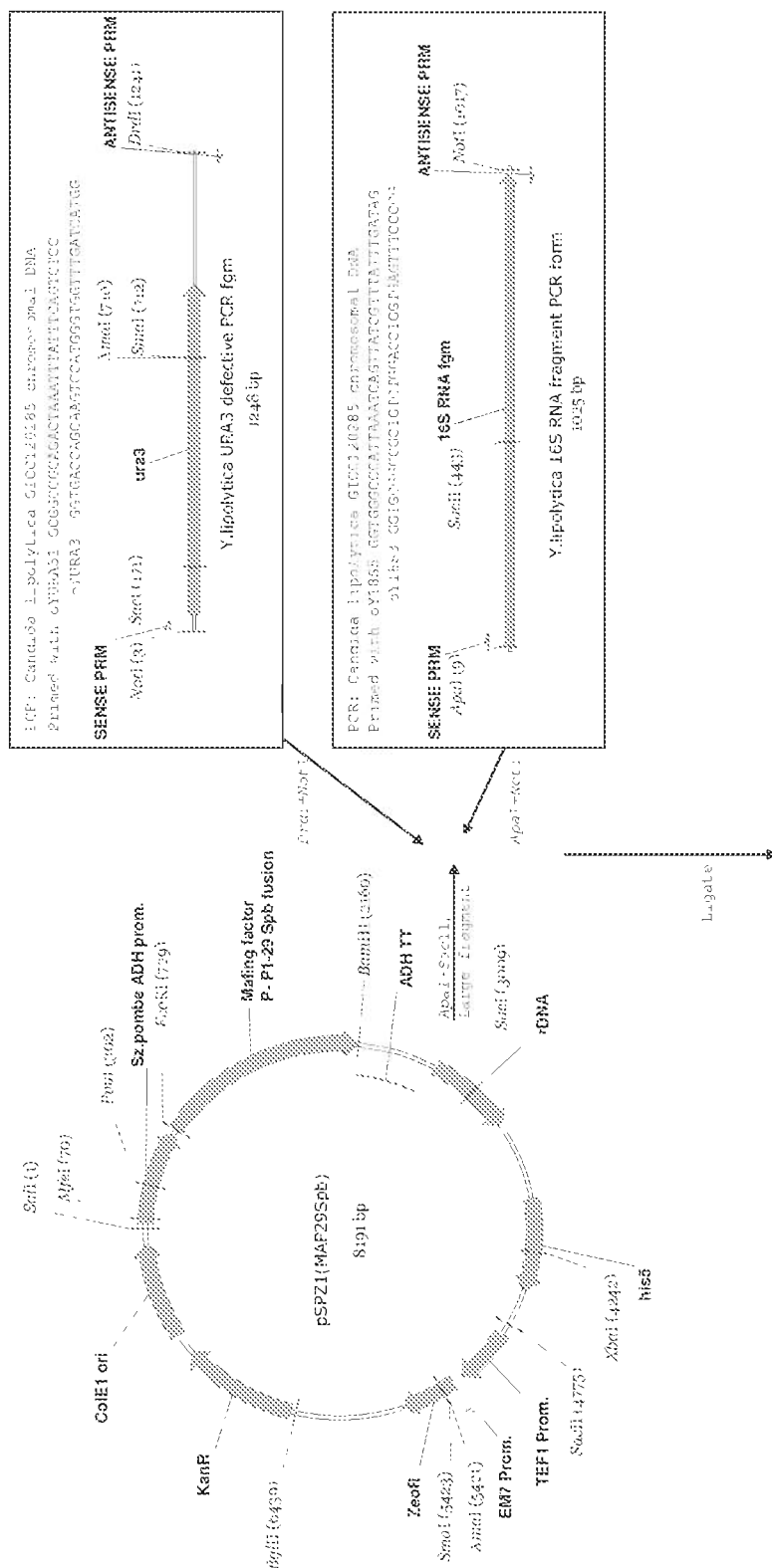


Figure 18A2

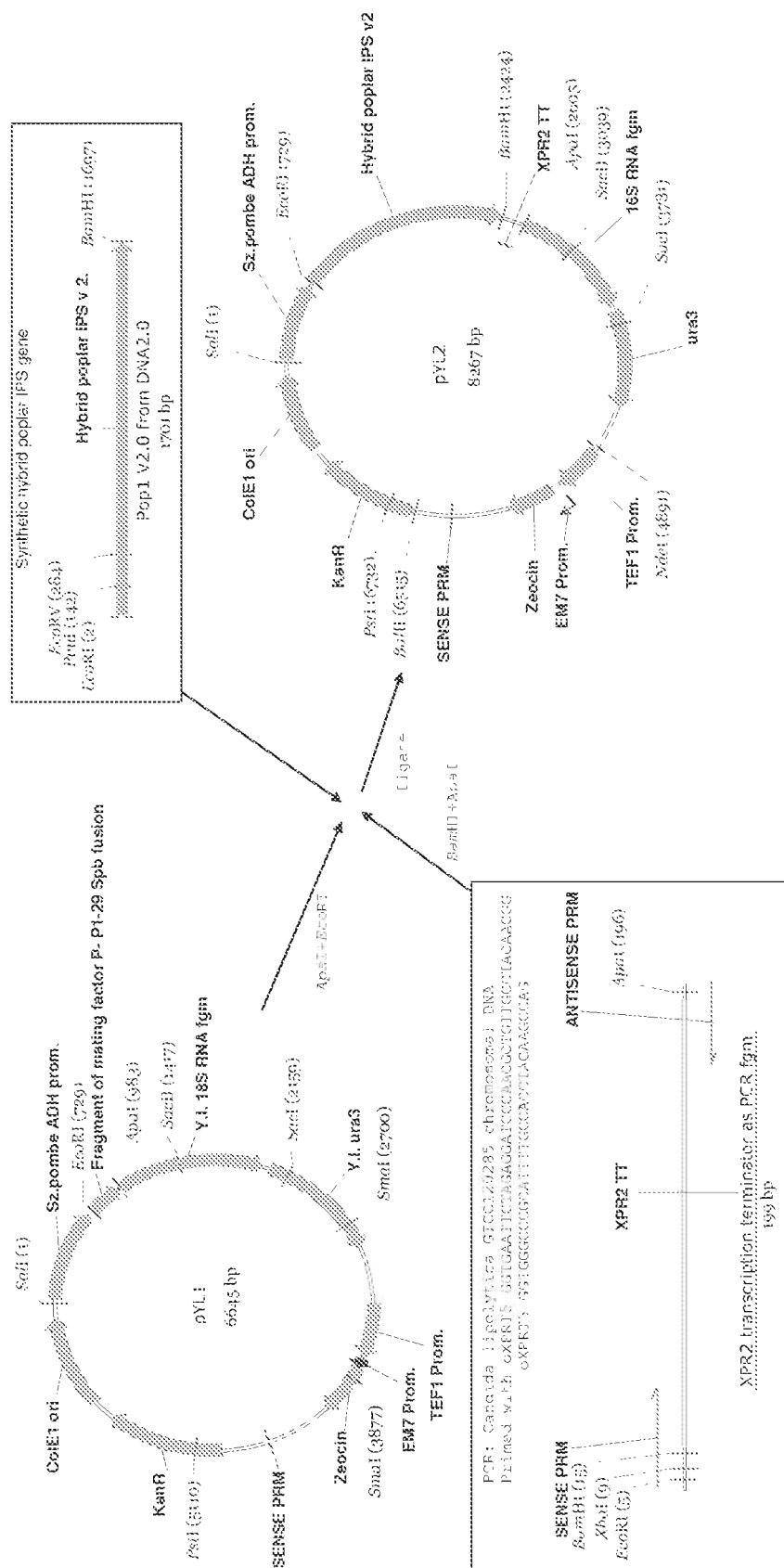
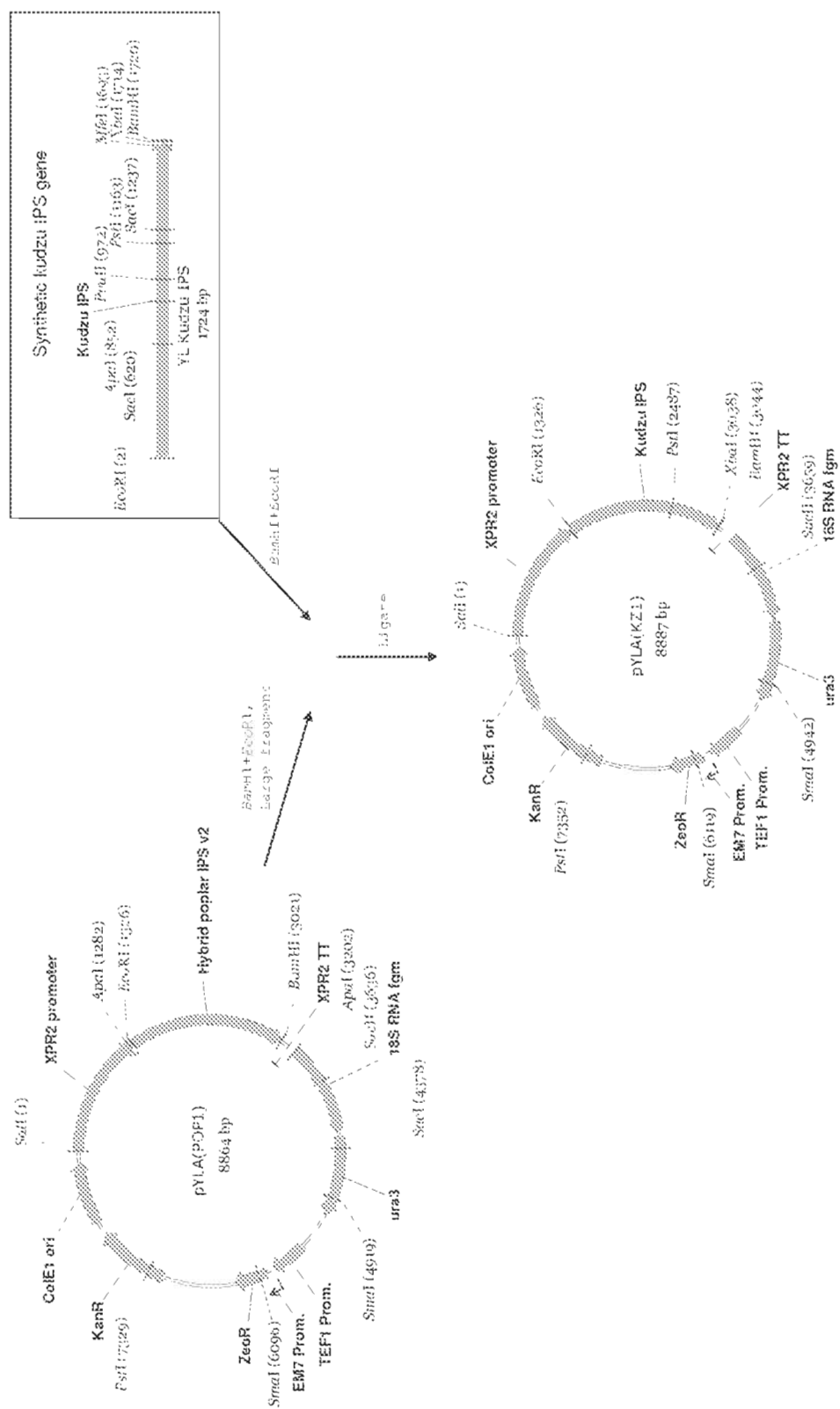


Figure 18C



08537

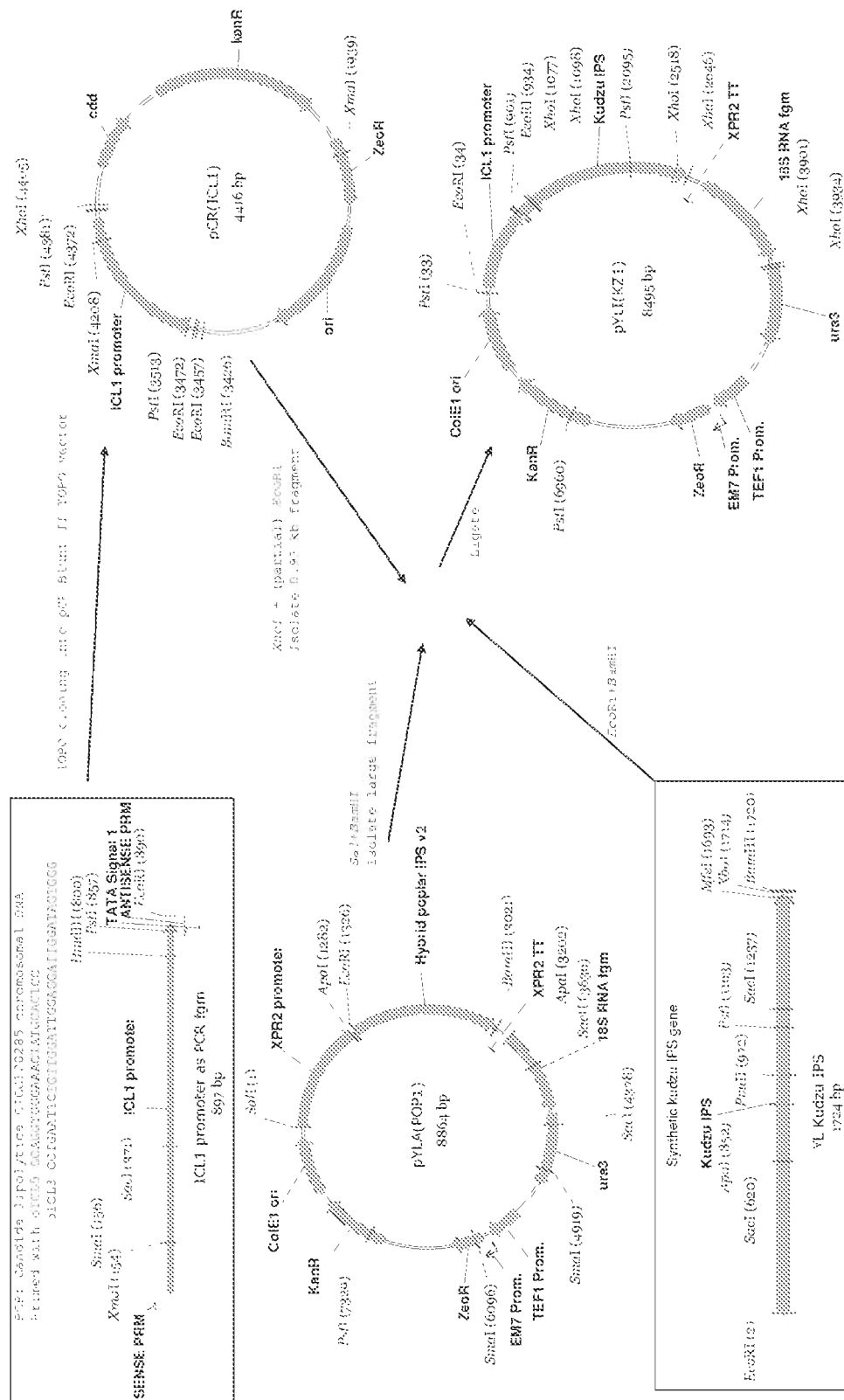


Figure 18E



Figure 18F

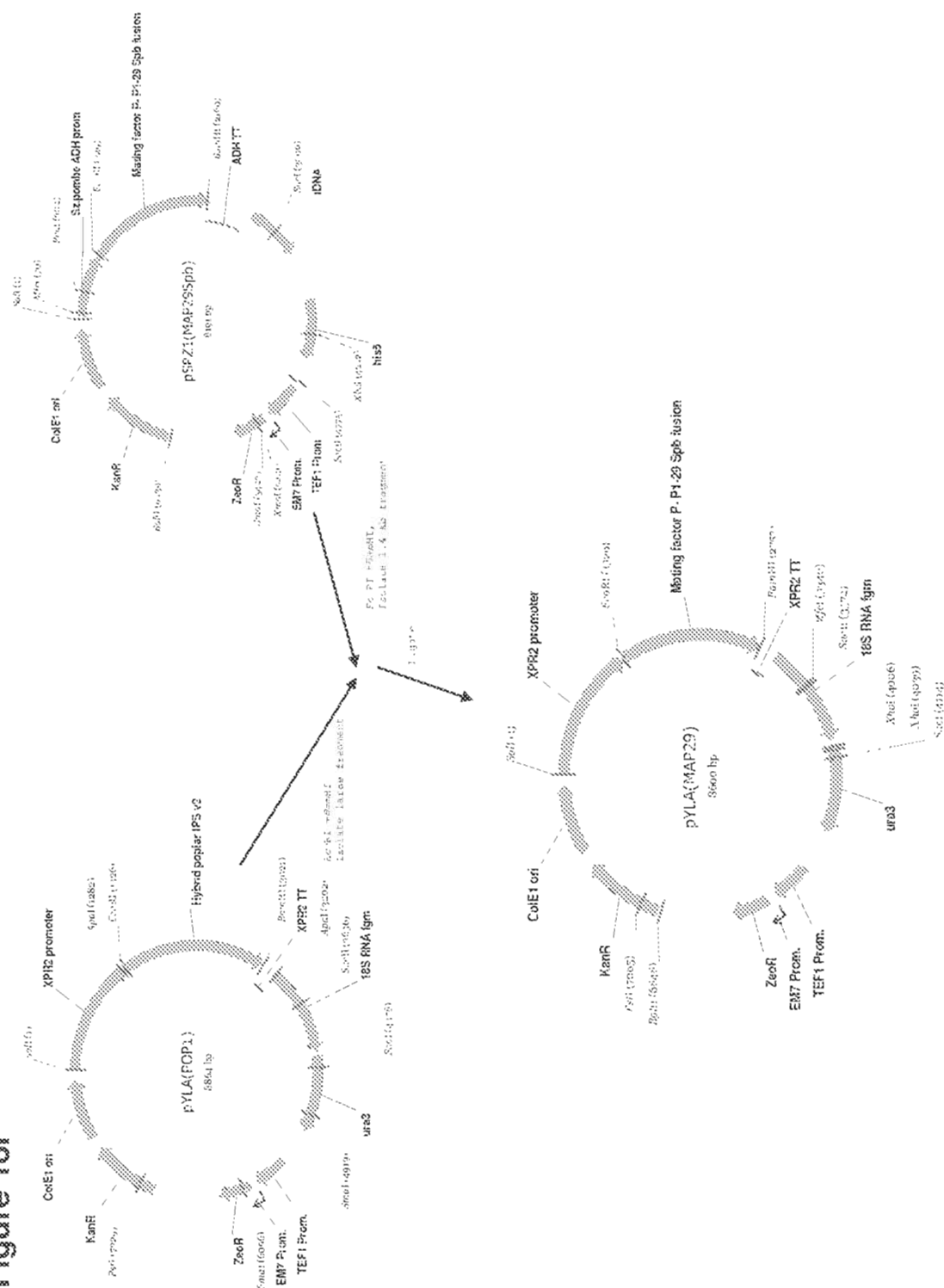


Figure 19A

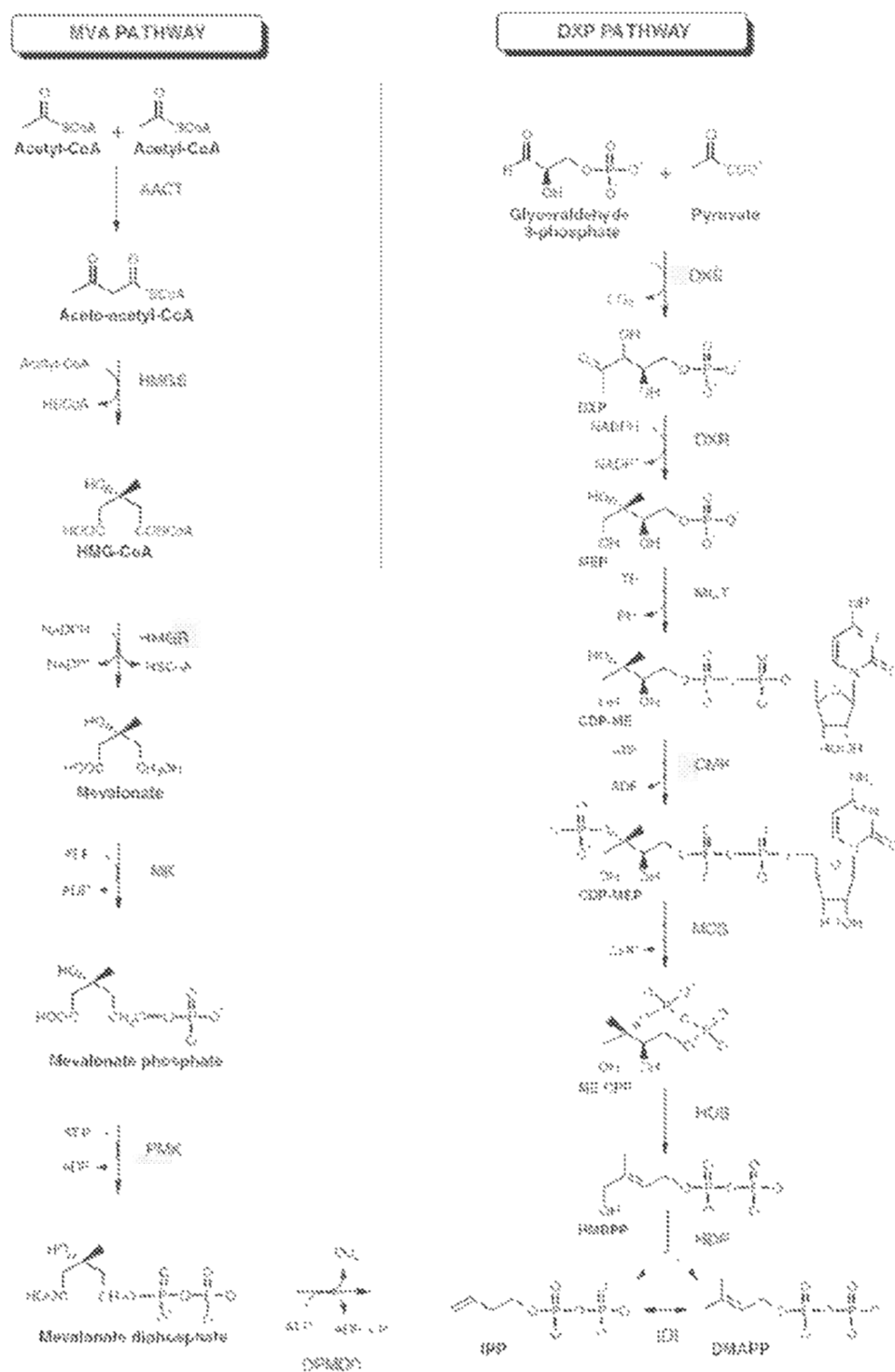


Figure 19B

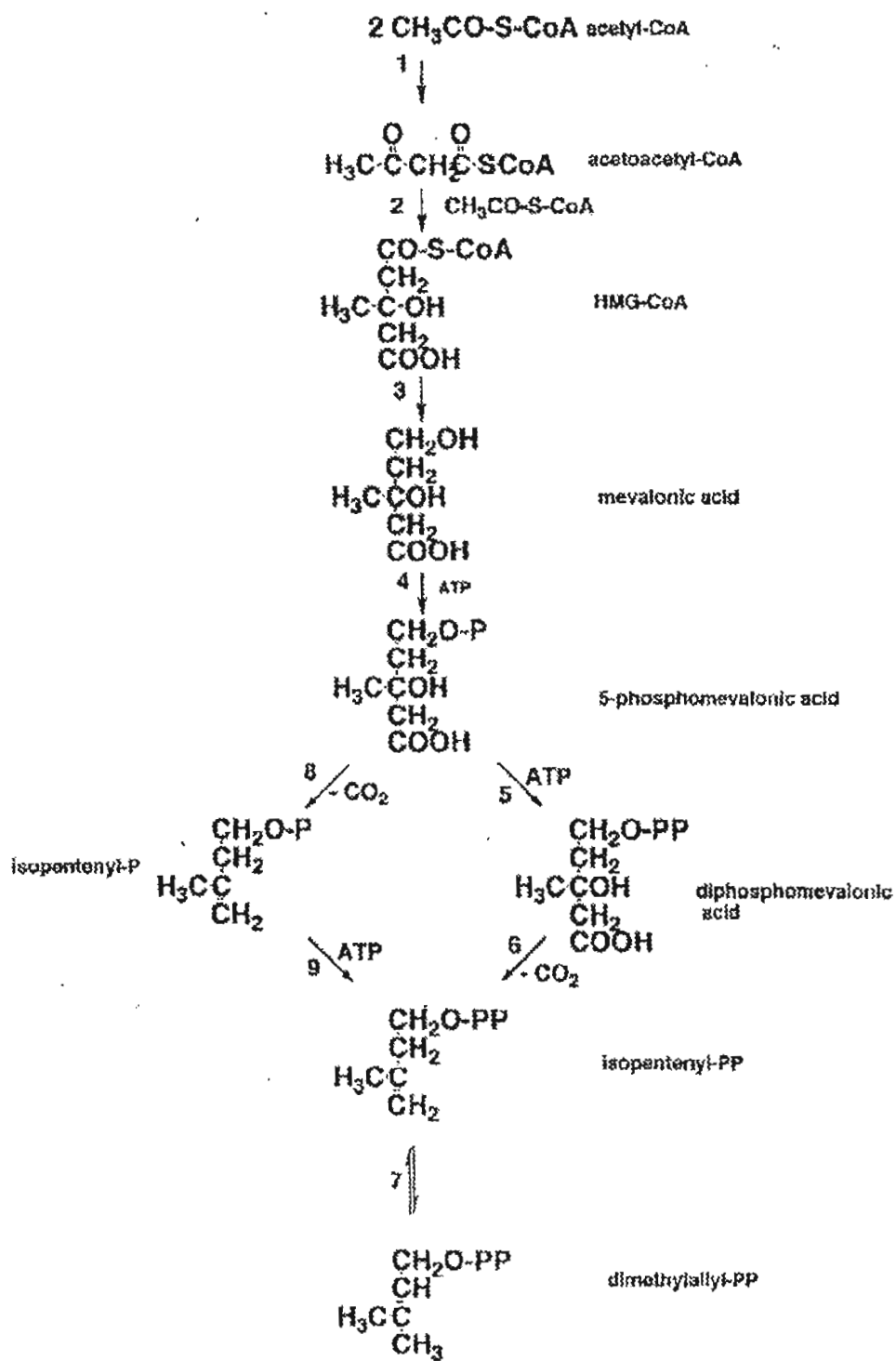


Figure 20

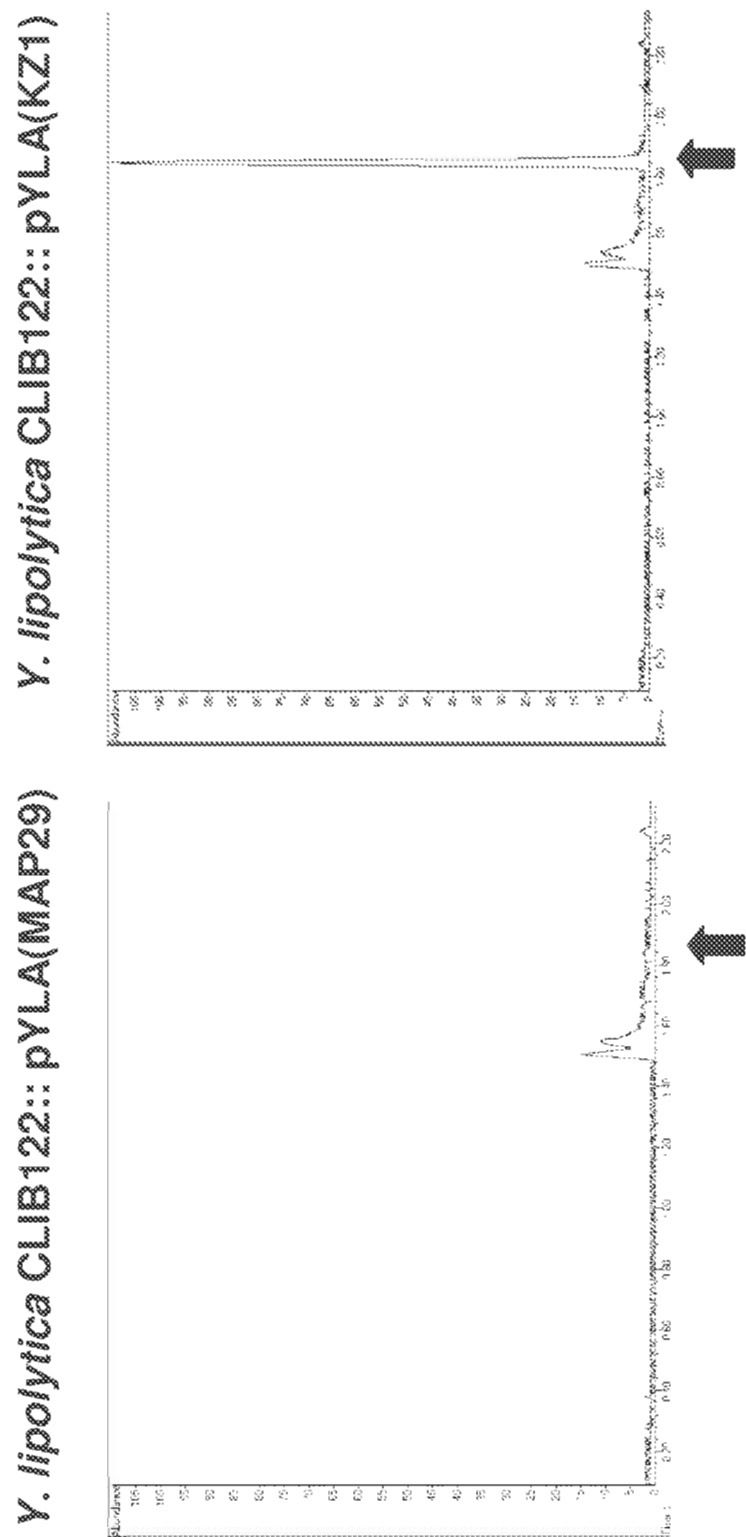


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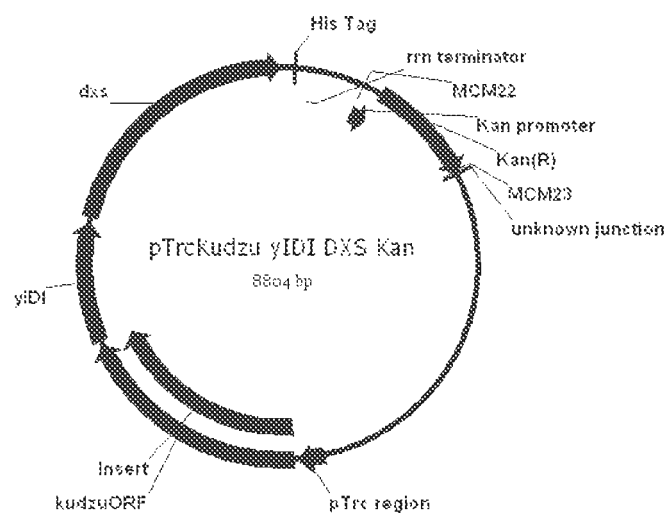


Figure 22A

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Figure 22B

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Figure 22C

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Figure 22D

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Figure 23A

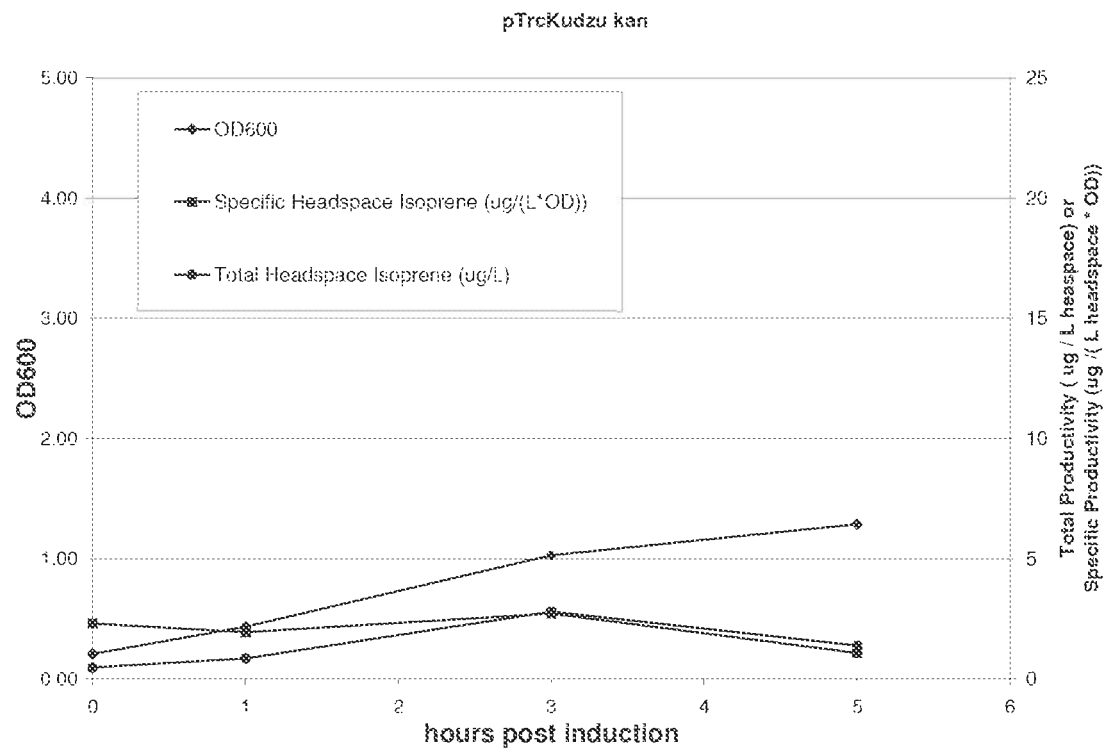


Figure 23B

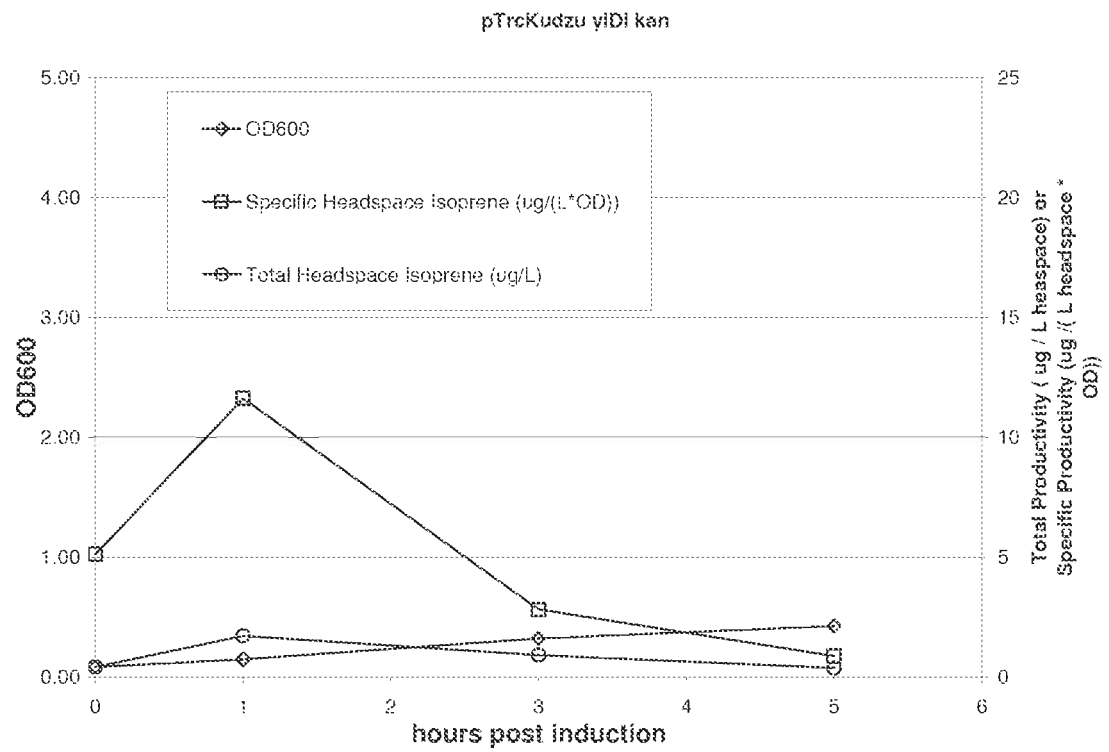


Figure 23C

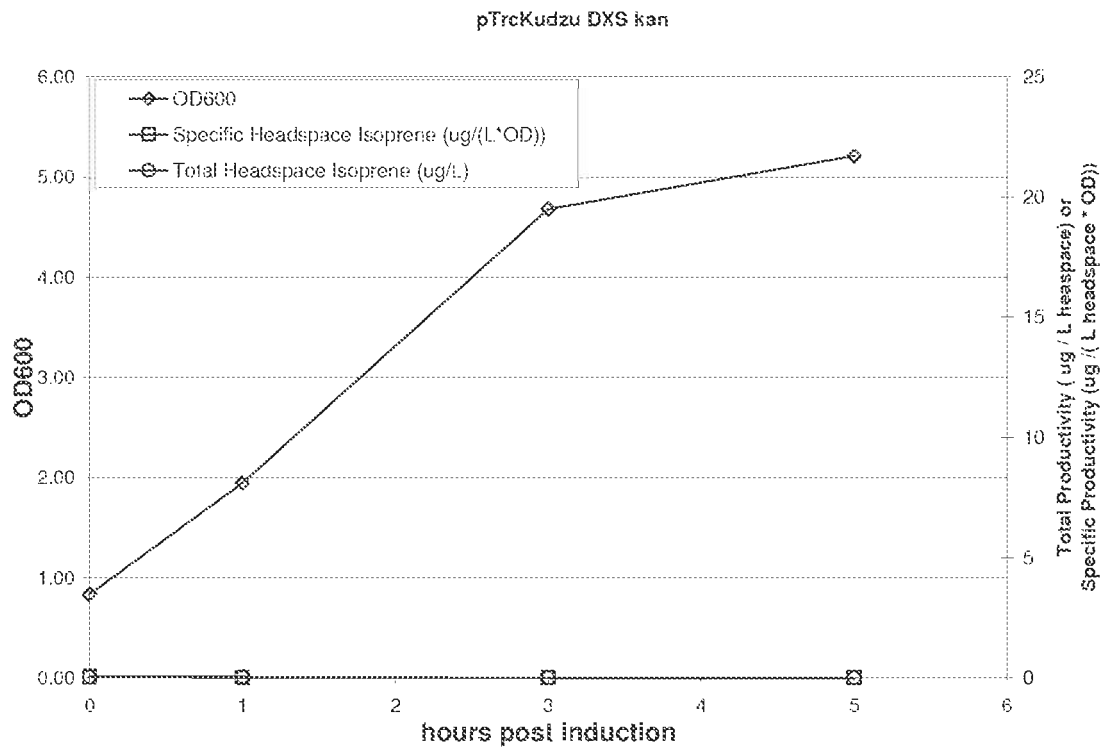


Figure 23D

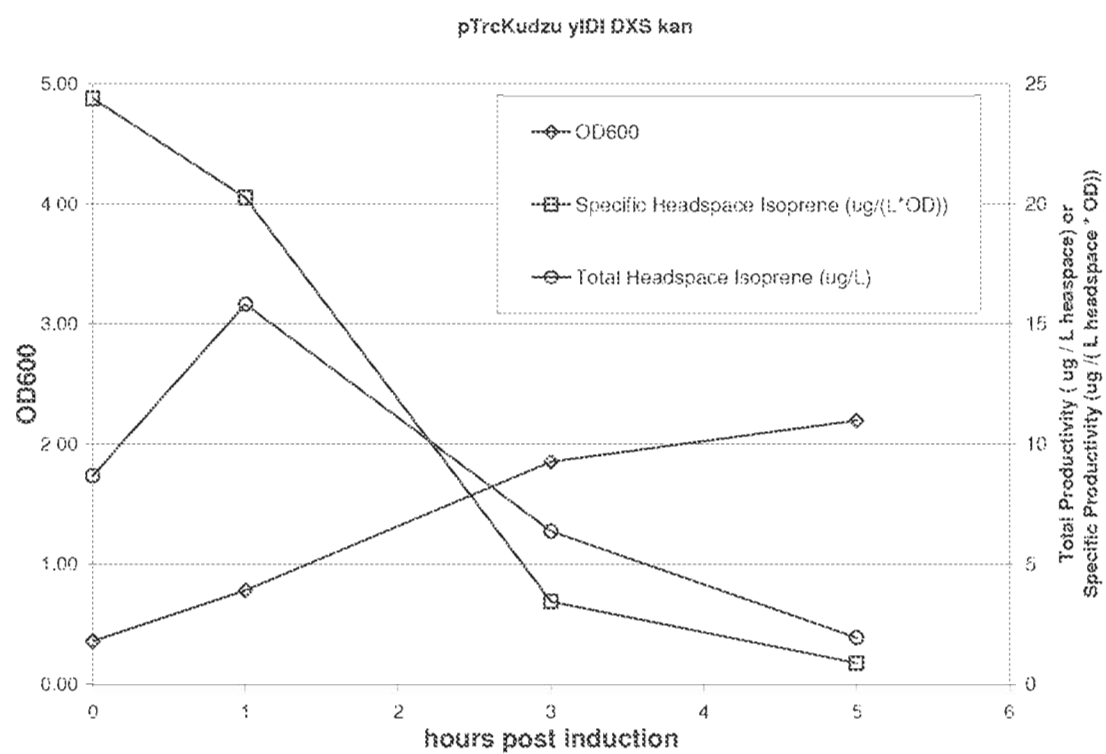


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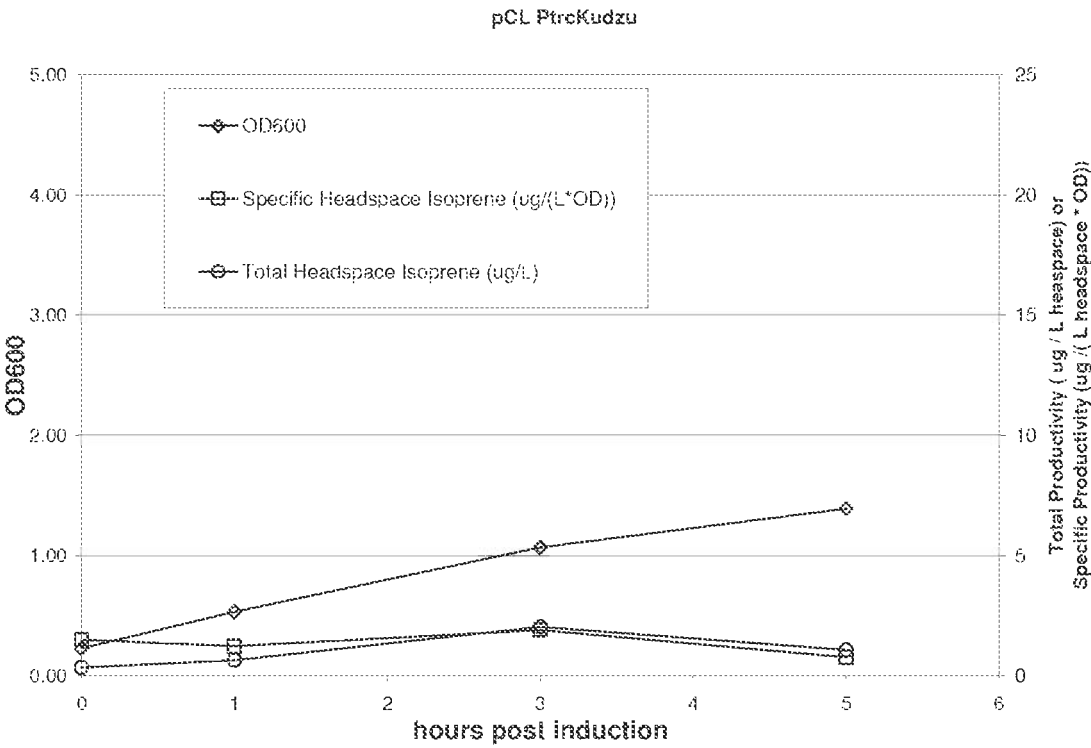


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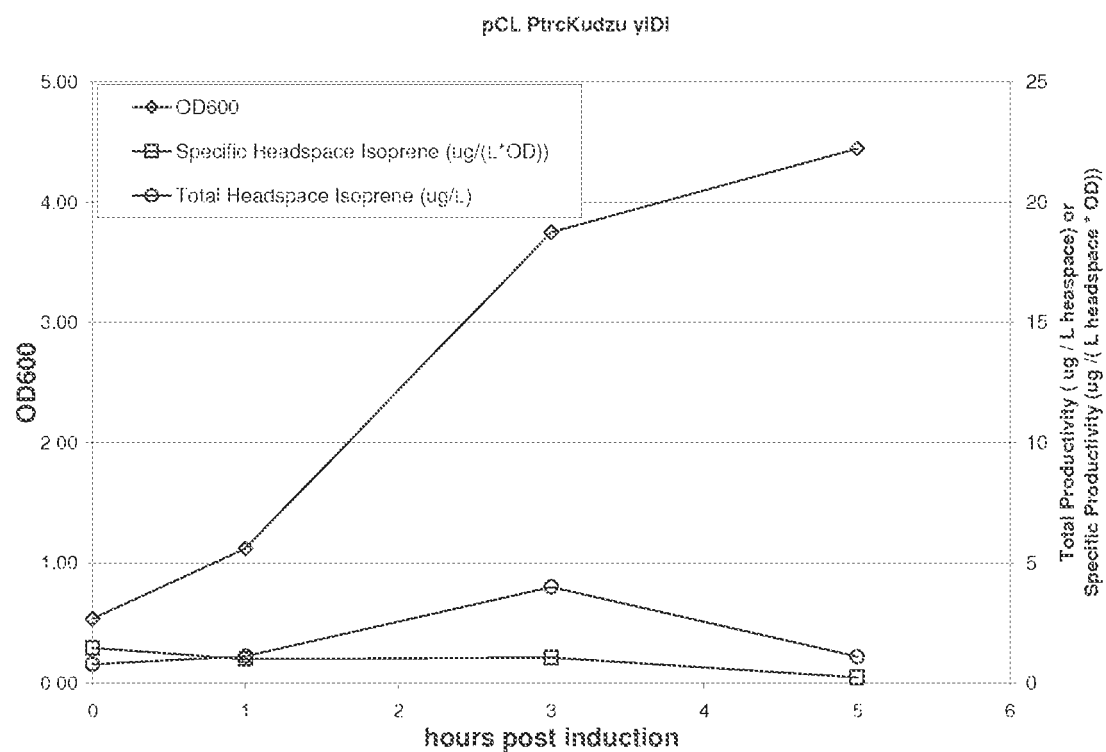


Figure 23G

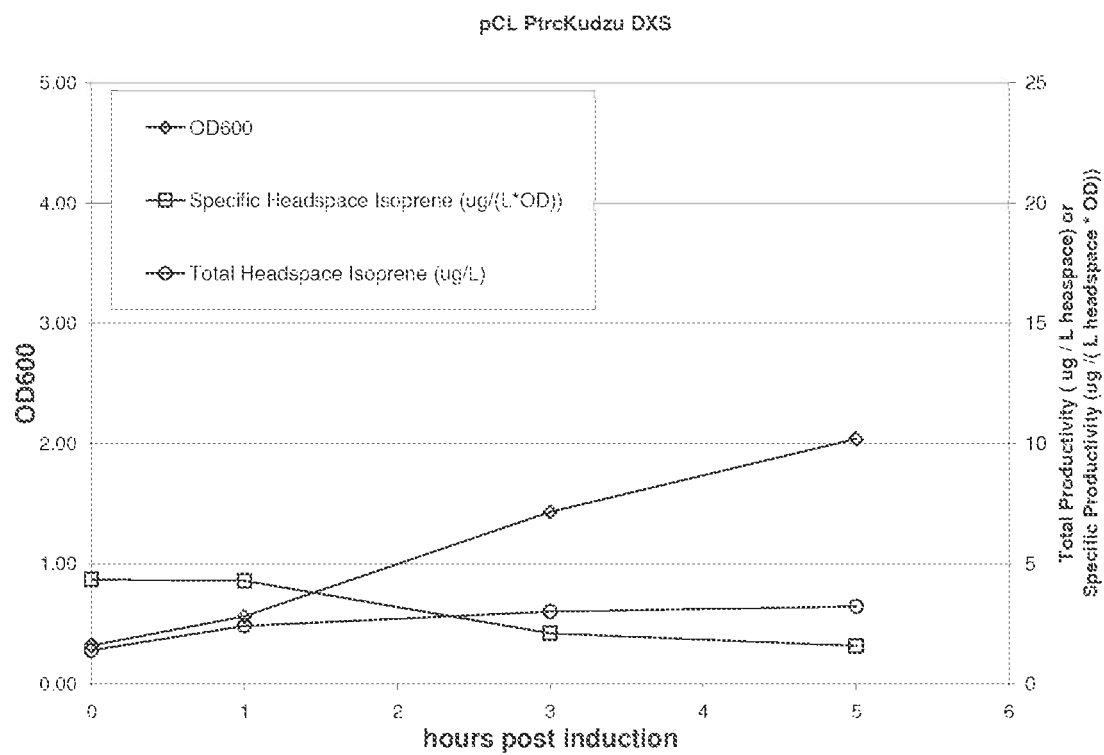


Figure 23H

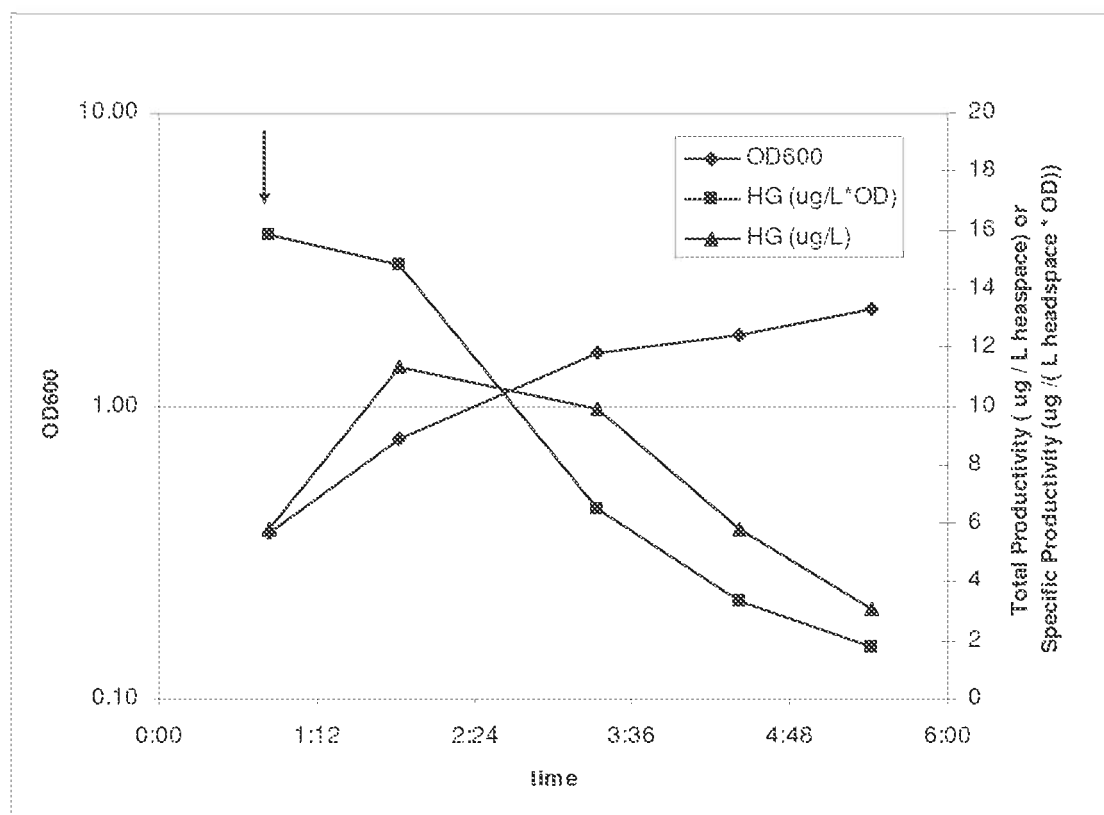


Figure 24

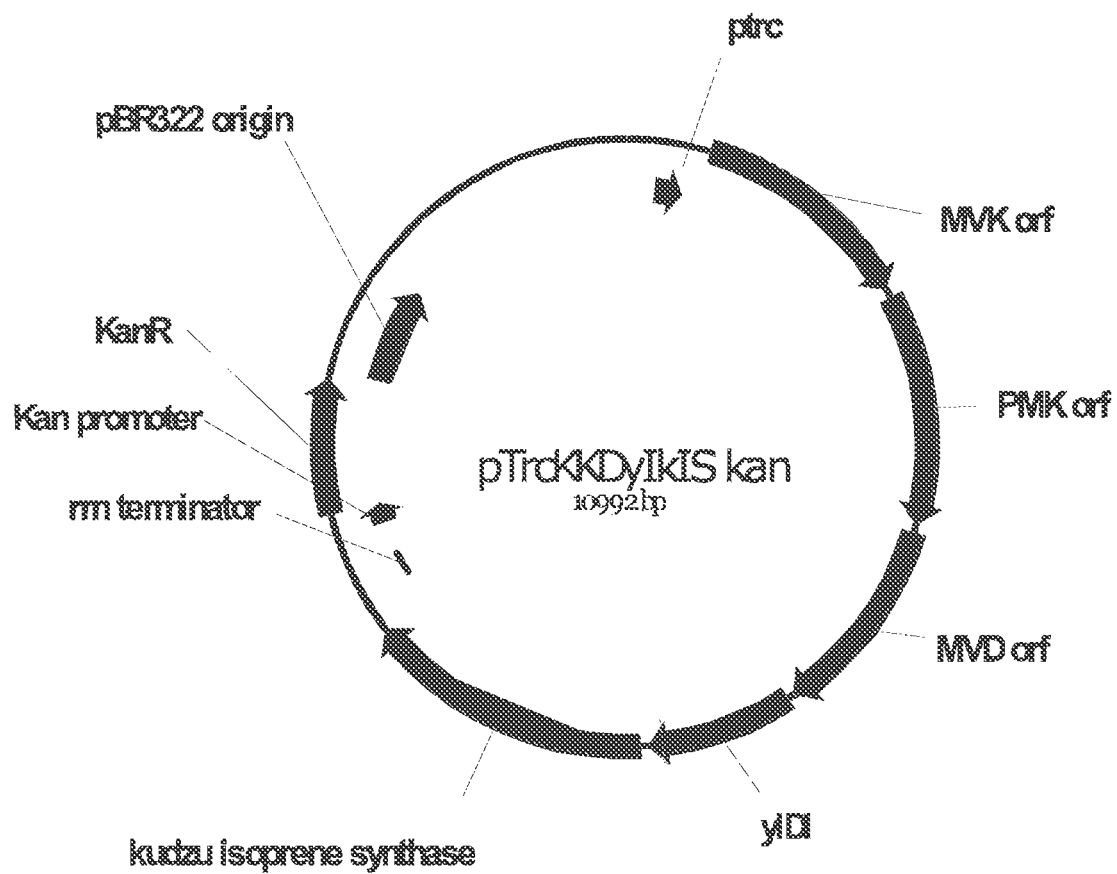


Figure 25A

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Figure 25B

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Figure 25C

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Figure 25D

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Figure 26

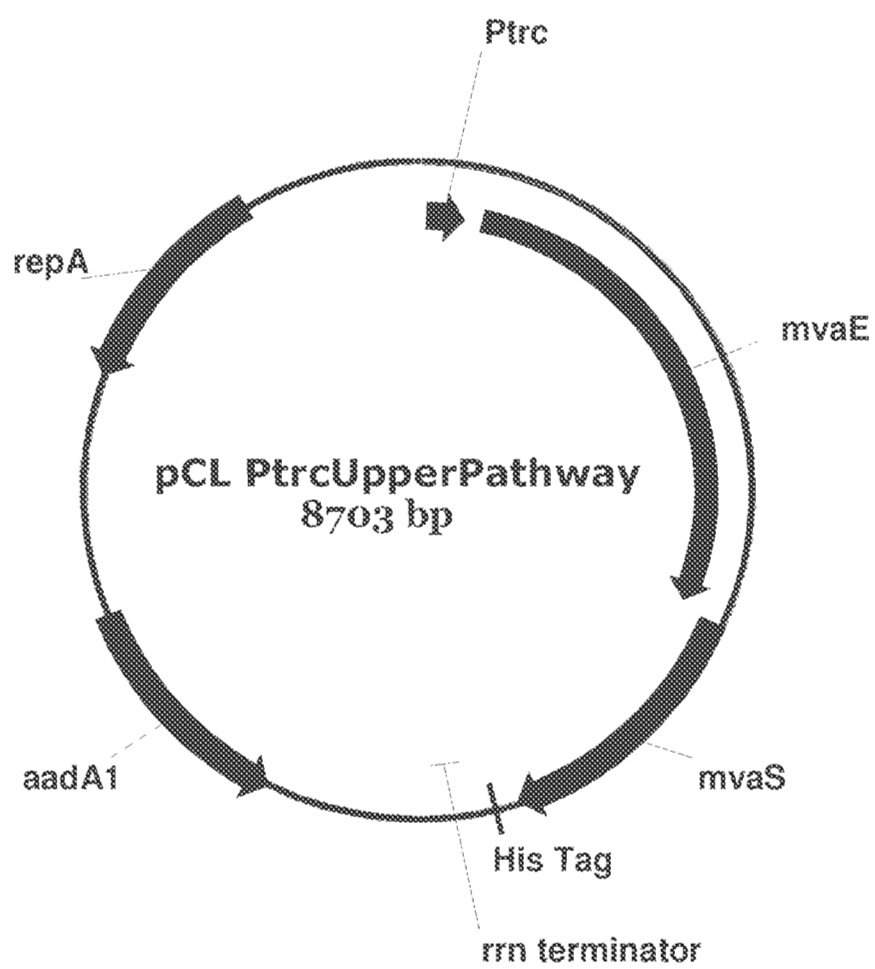


Figure 27A

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Figure 27B

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Figure 27C

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Figure 27D

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(SEQ ID NO:46)

Figure 28

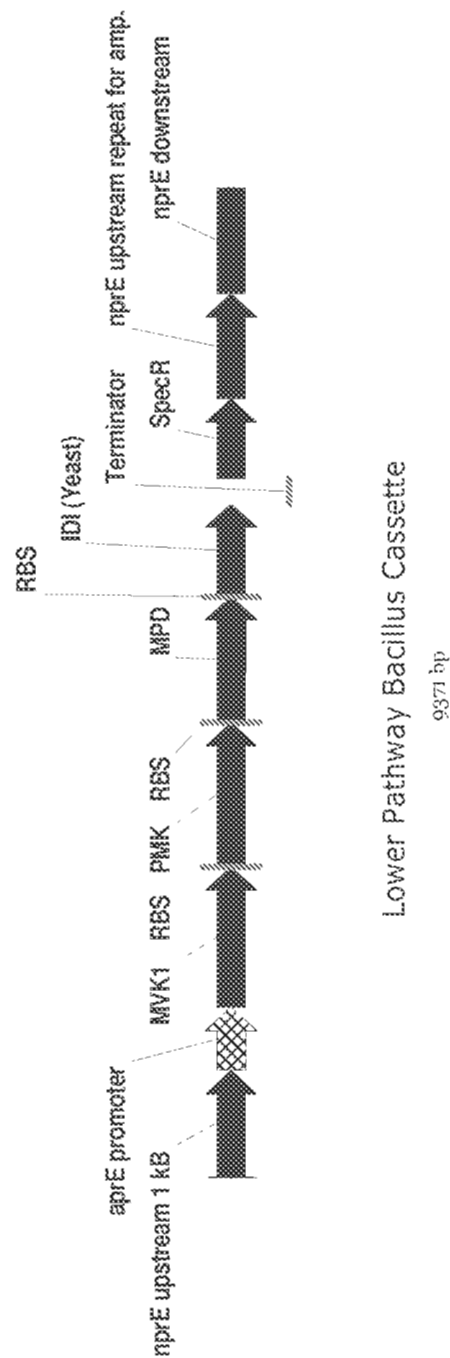


Figure 29A

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Figure 29B

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Figure 29C

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Figure 29D

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(SEQ ID NO:47)

Figure 30

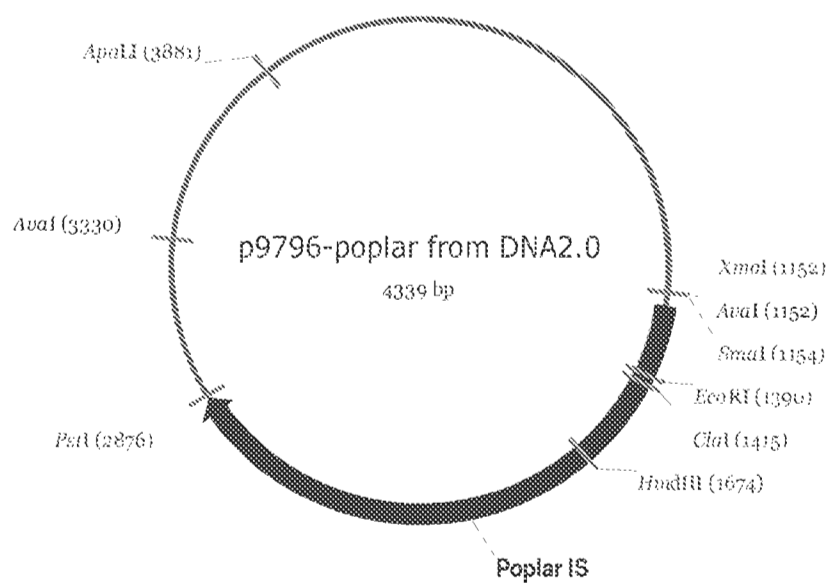


Figure 31A

5'-

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Figure 31B

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(SEQ ID NO:48)

Figure 32

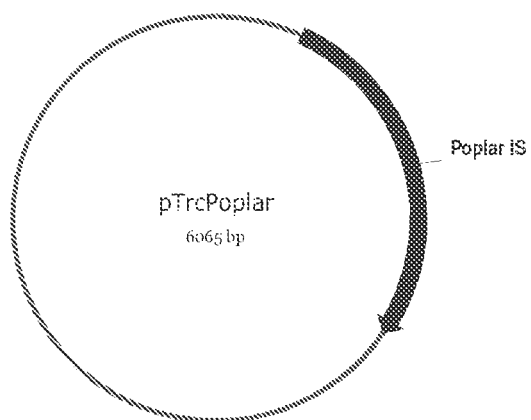


Figure 33A

5'-

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Figure 33C

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(SEQ ID NO:49)

Figure 34

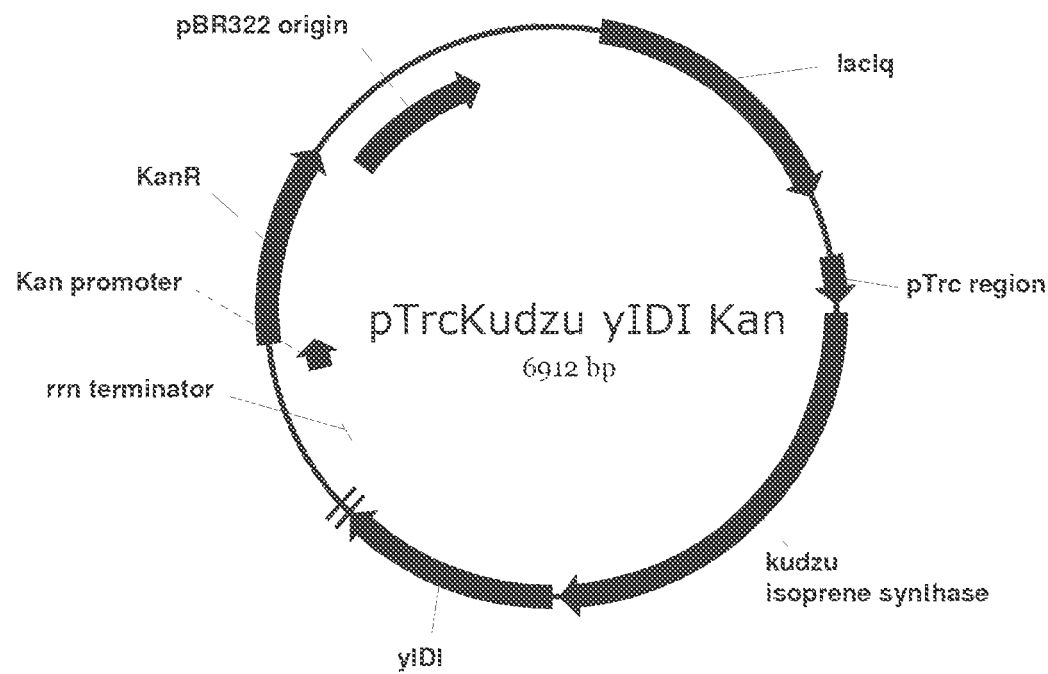


Figure 35A

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Figure 35C

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Figure 36

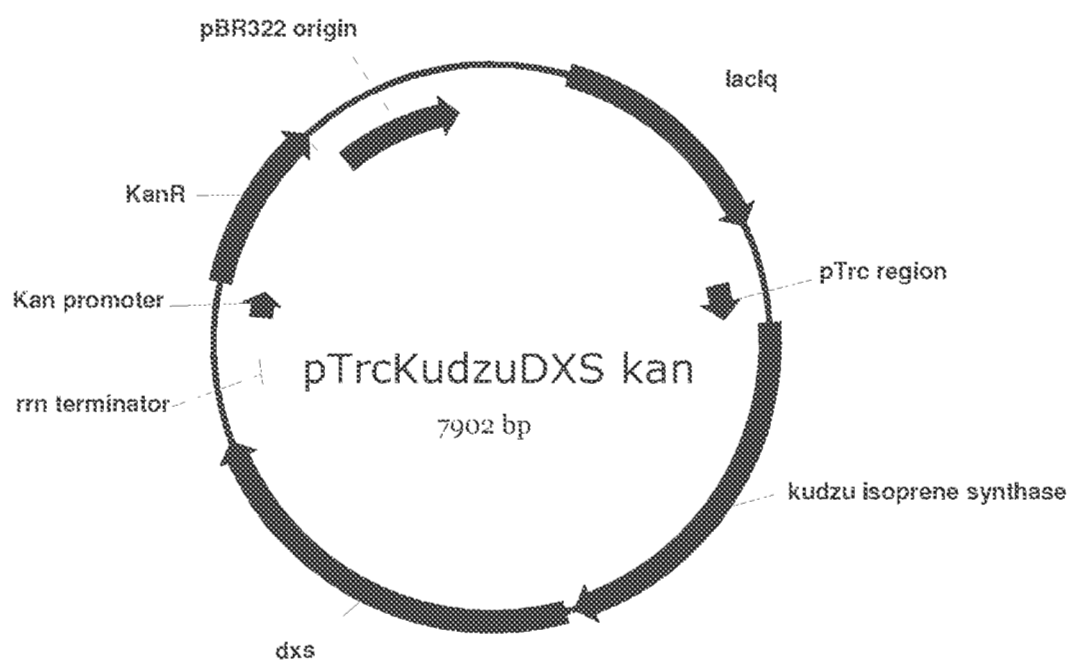


Figure 37A

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Figure 37B

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Figure 37C

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Figure 38

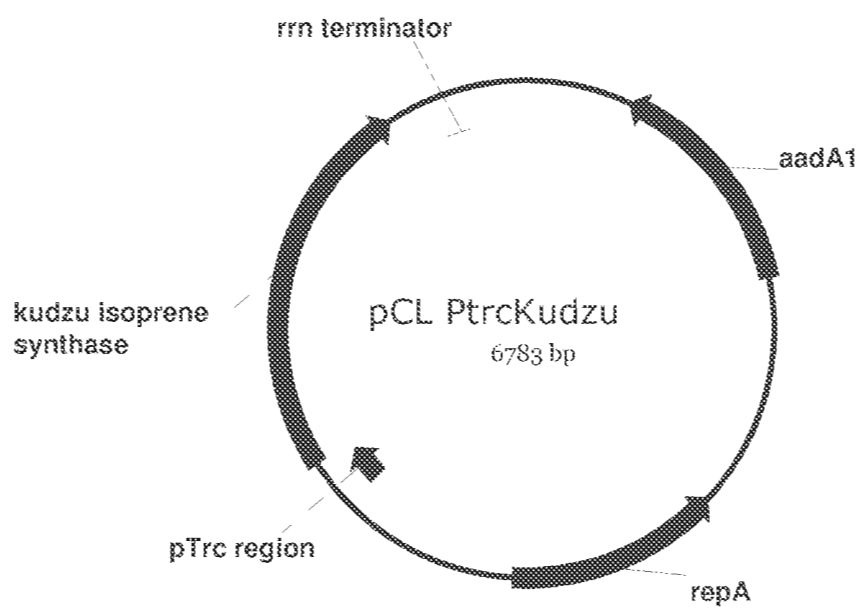


Figure 39A

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Figure 39B

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Figure 39C

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Figure 40

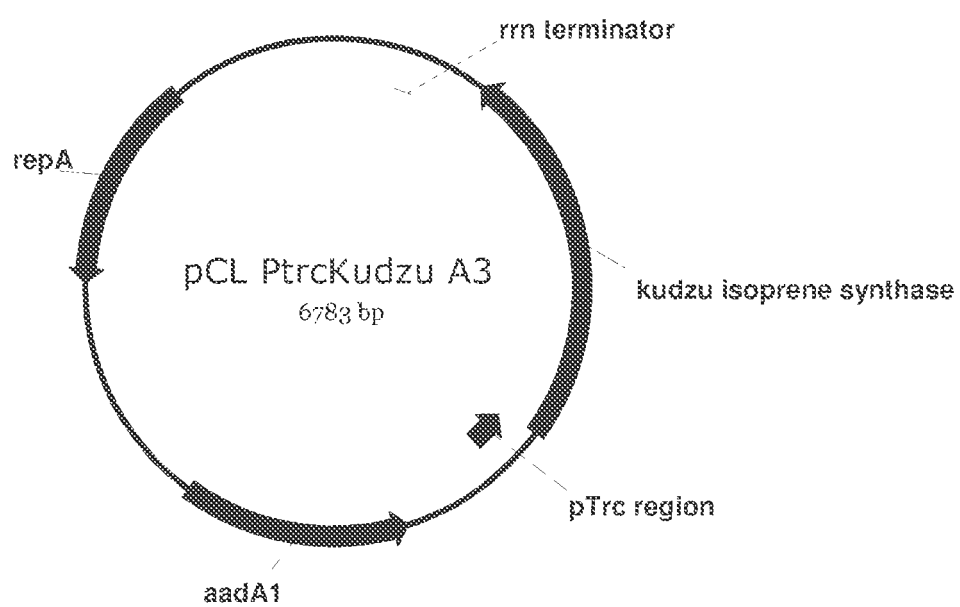


Figure 41A

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Figure 41B

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Figure 41C

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(SEQ ID NO:53)

Figure 42

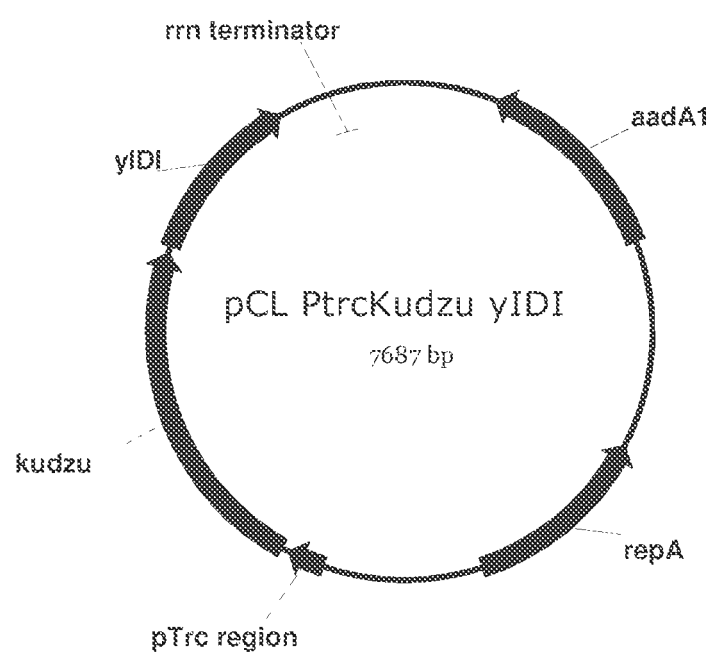


Figure 43A

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Figure 43B

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Figure 43C

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Figure 44

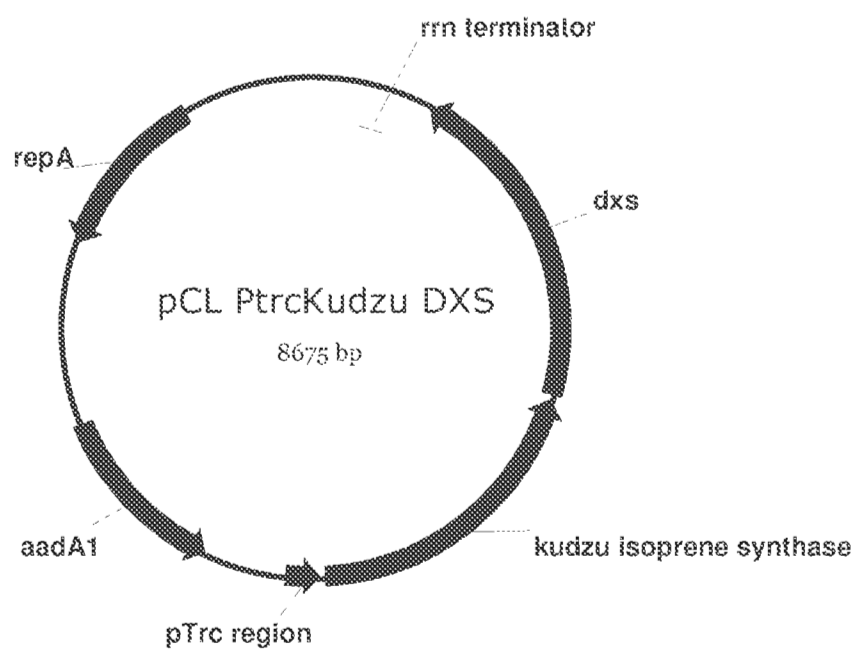


Figure 45A

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Figure 45B

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Figure 45C

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Figure 45D

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Figure 46A

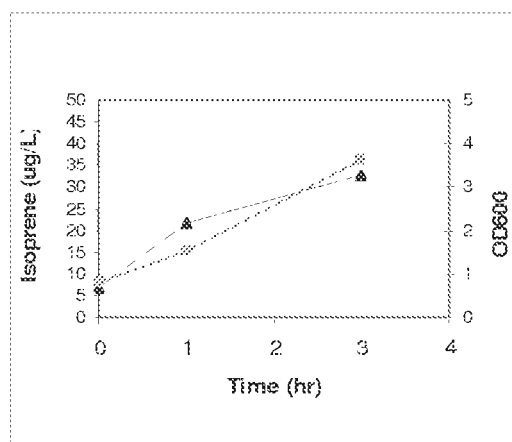


Figure 46B

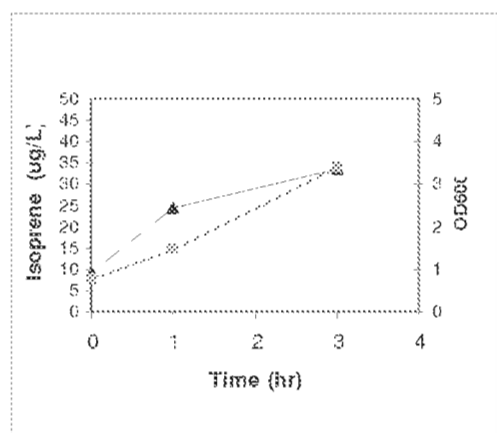


Figure 46C

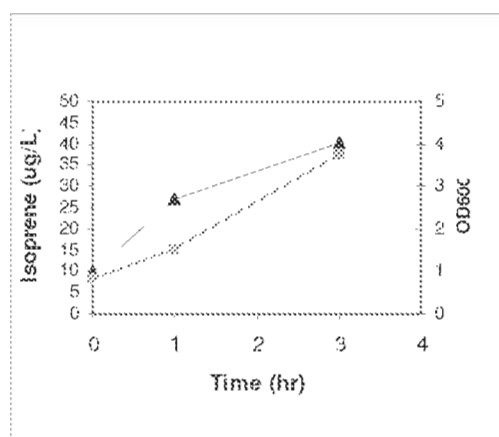


Figure 46D

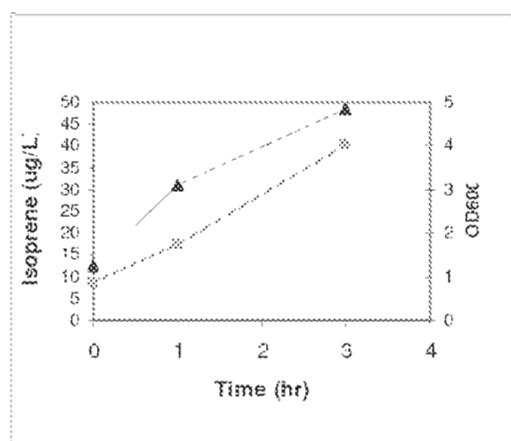


Figure 46E

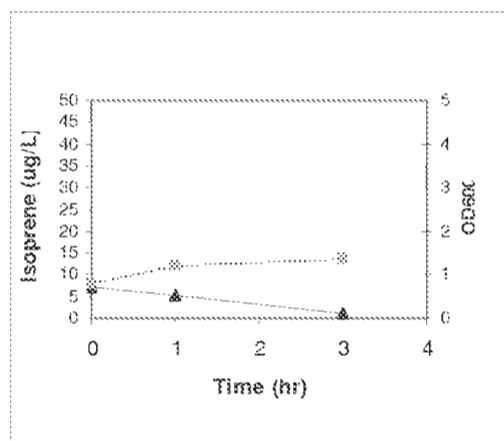


Figure 47A

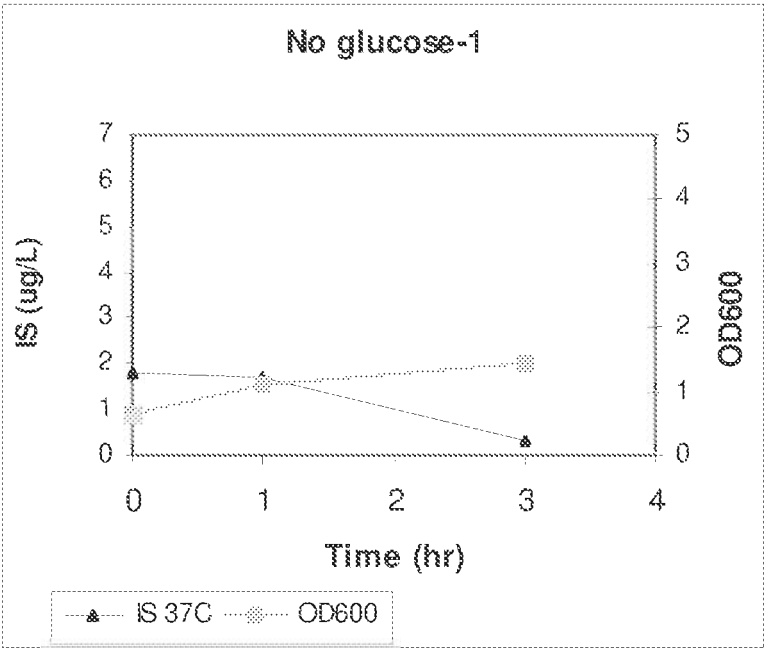


Figure 47B

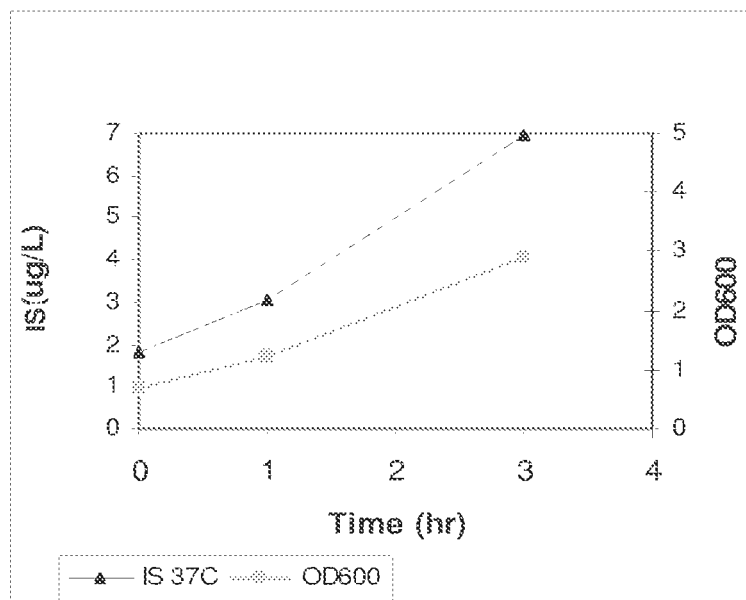


Figure 47C

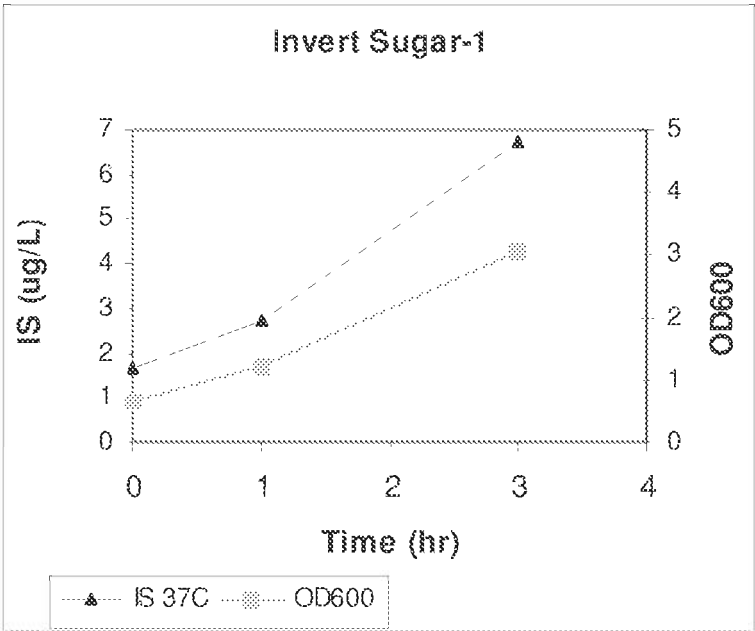


Figure 47D

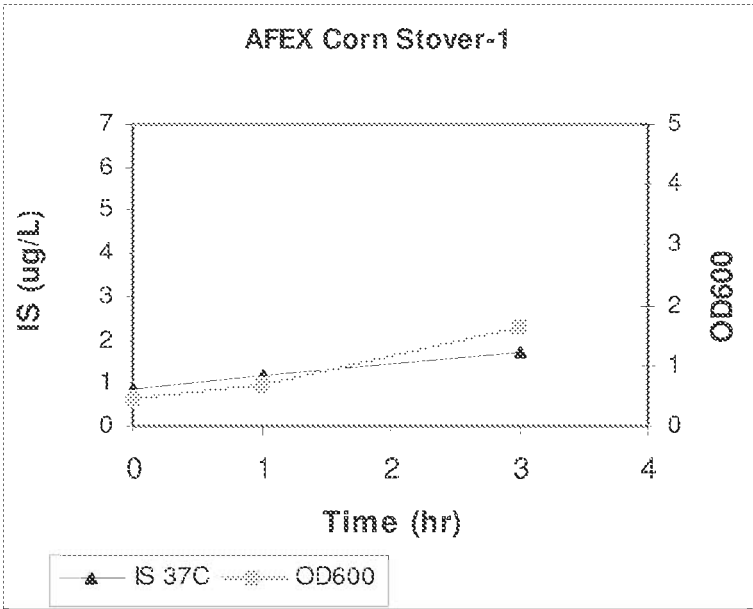


Figure 48A

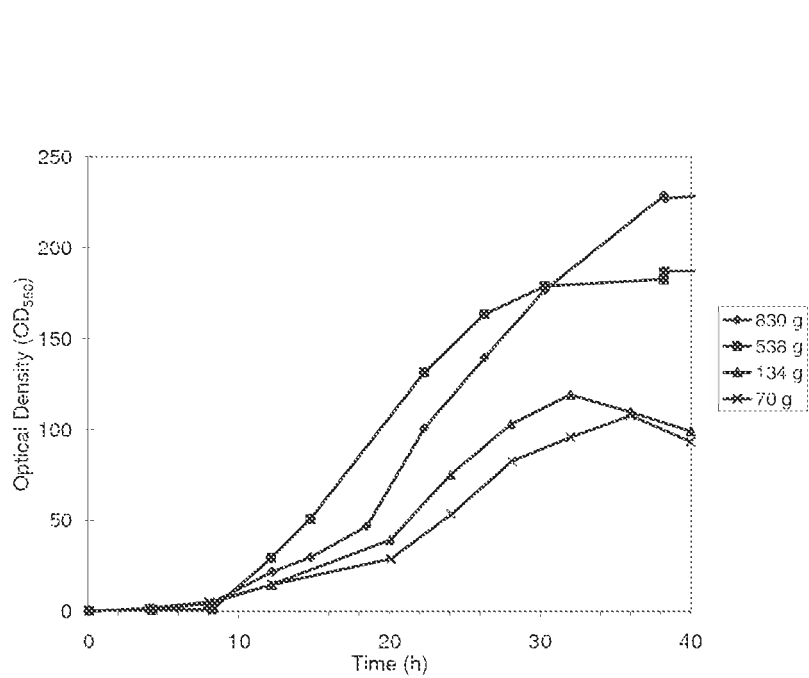


Figure 48B

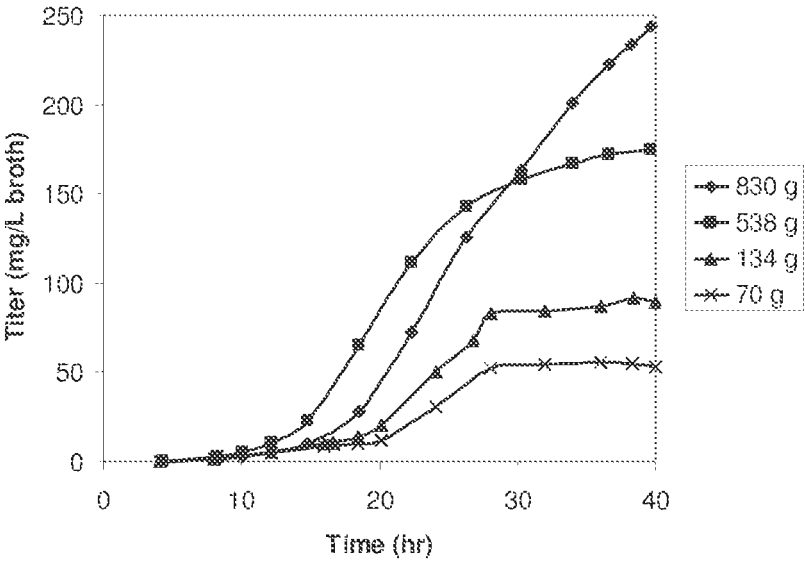


Figure 48C

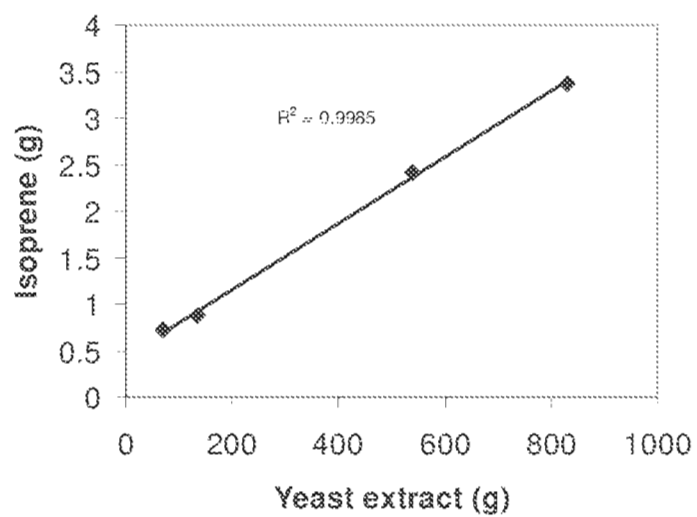


Figure 49A

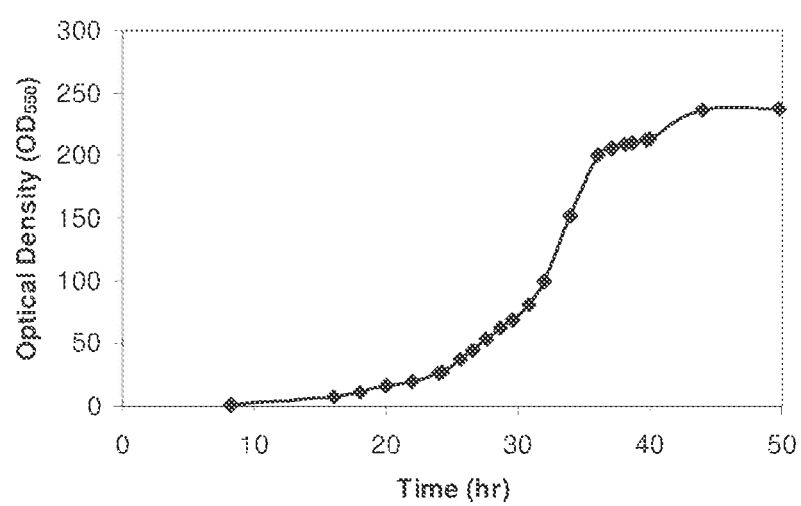


Figure 49B

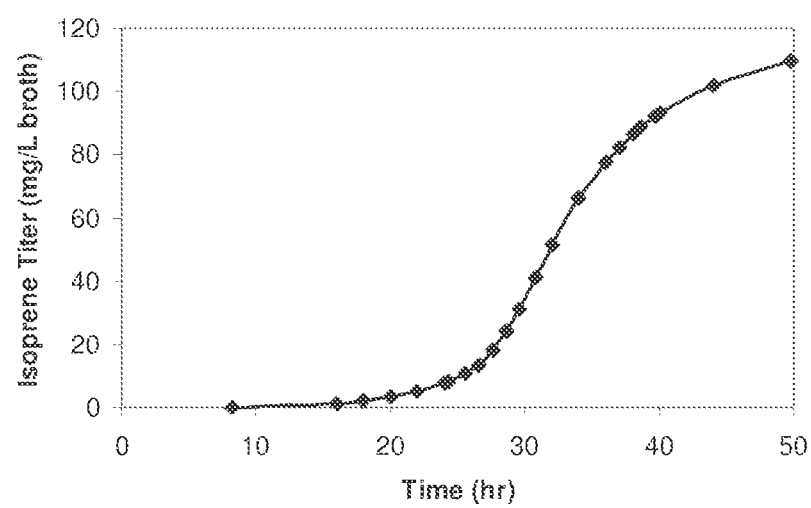


Figure 49C

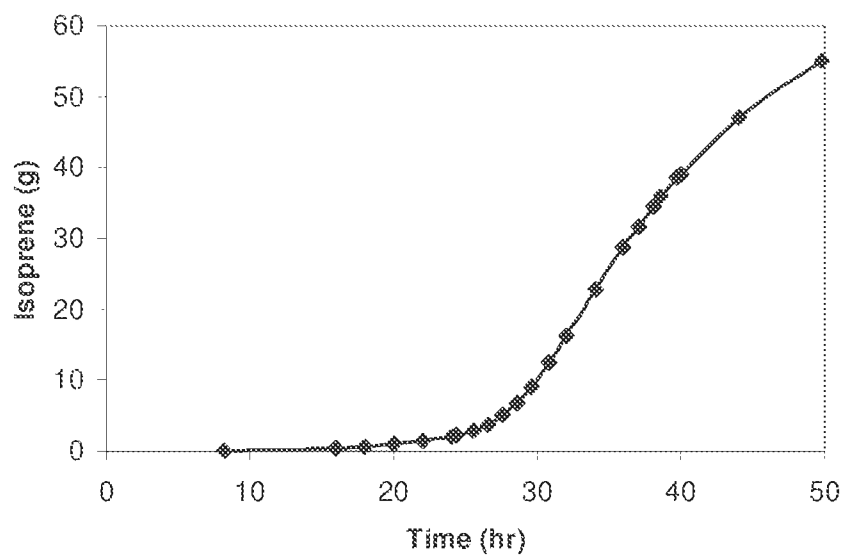


Figure 50

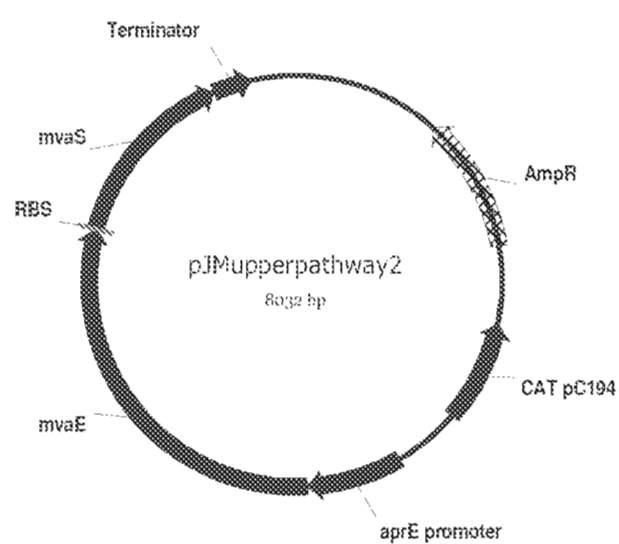


Figure 51A

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Figure 51B

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Figure 51C

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acctgtcgtgccagctgcalttaagaaatcggccaaacgcgcggggagaggcggttgcgtattgggcgctcttccg
cttctcgtcactgac

(SEQ ID NO:56)

Figure 52

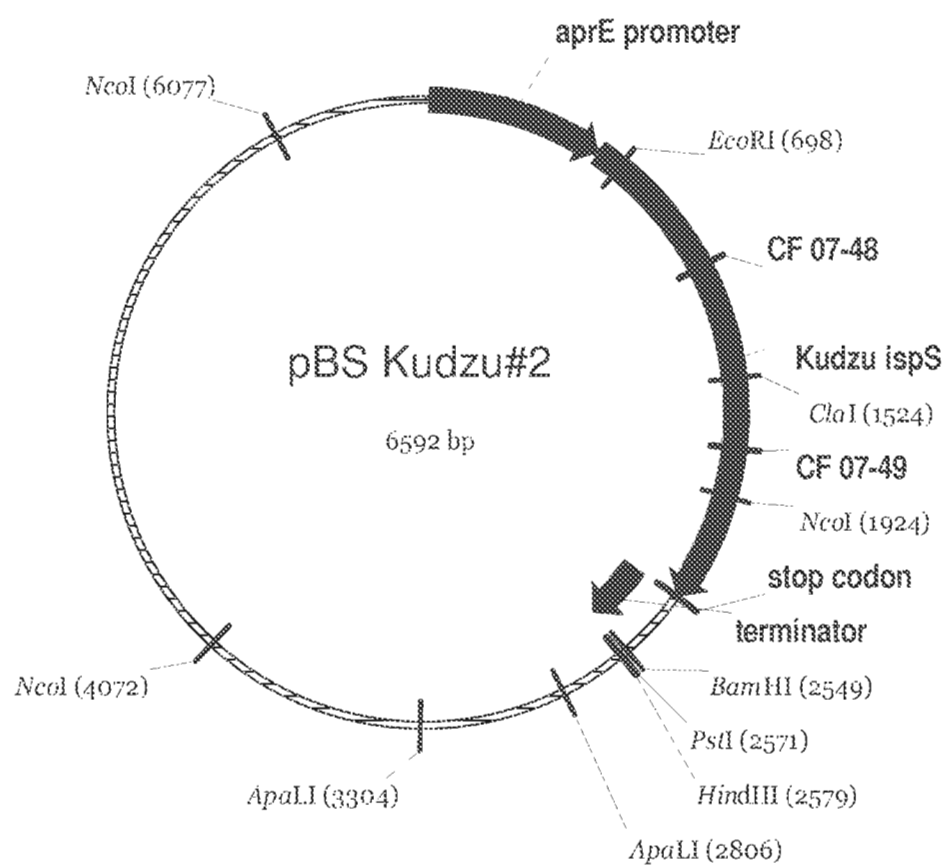


Figure 53A

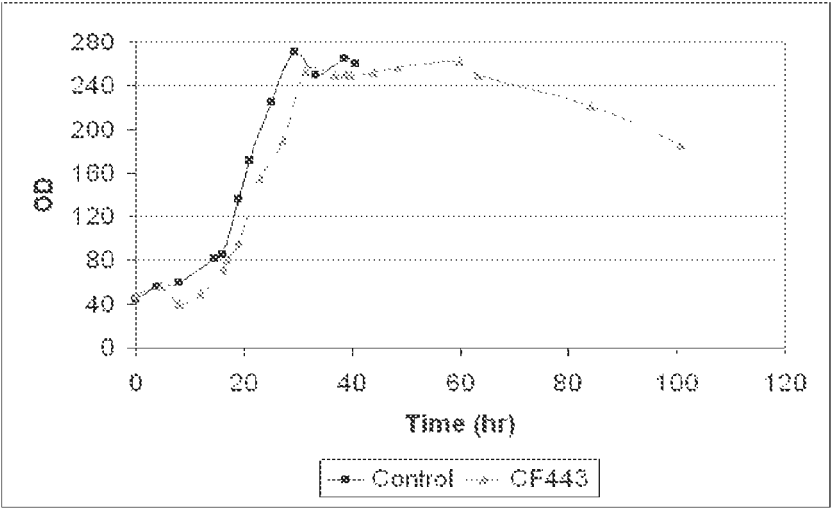


Figure 53B

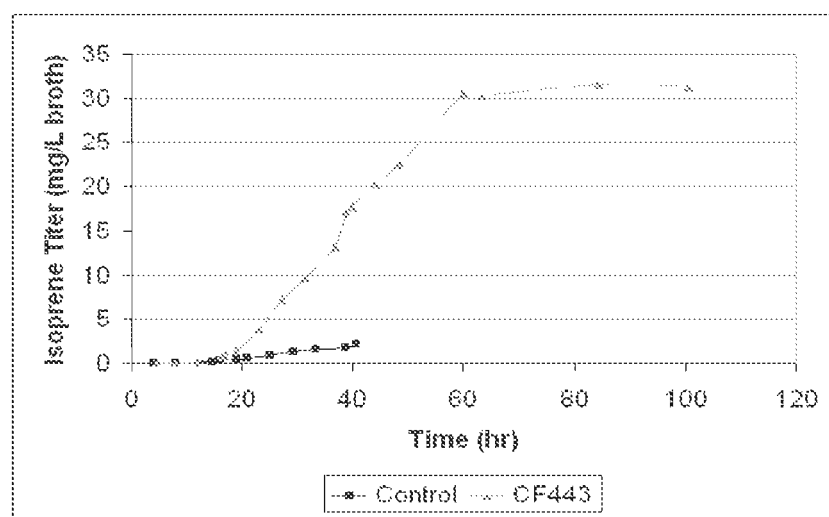


Figure 54

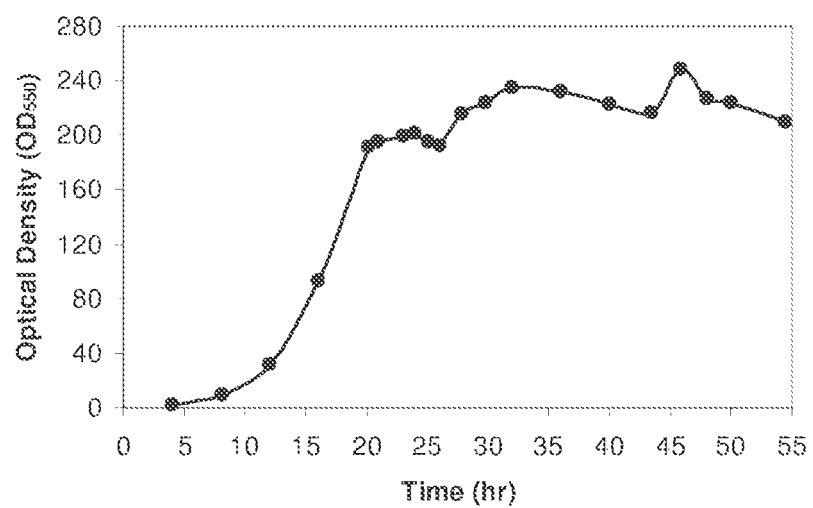


Figure 55

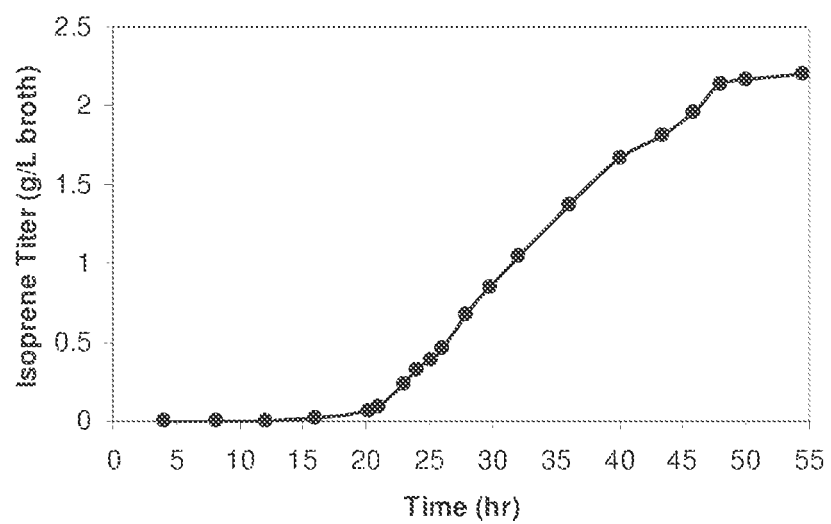


Figure 56

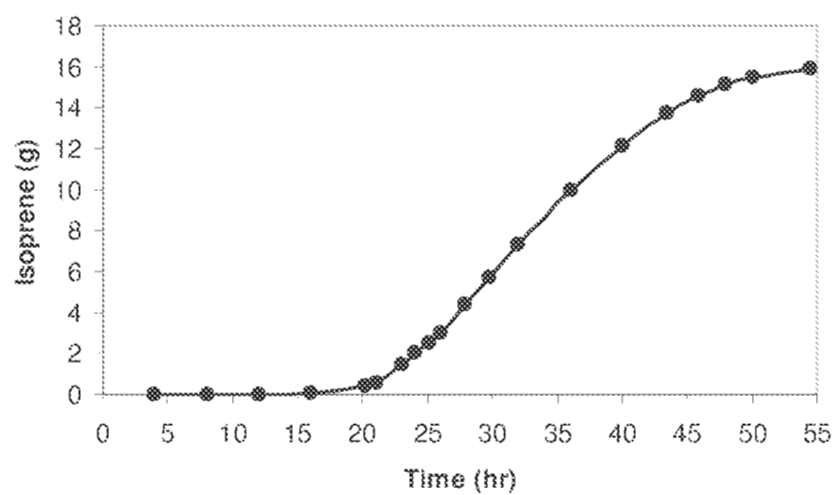


Figure 57

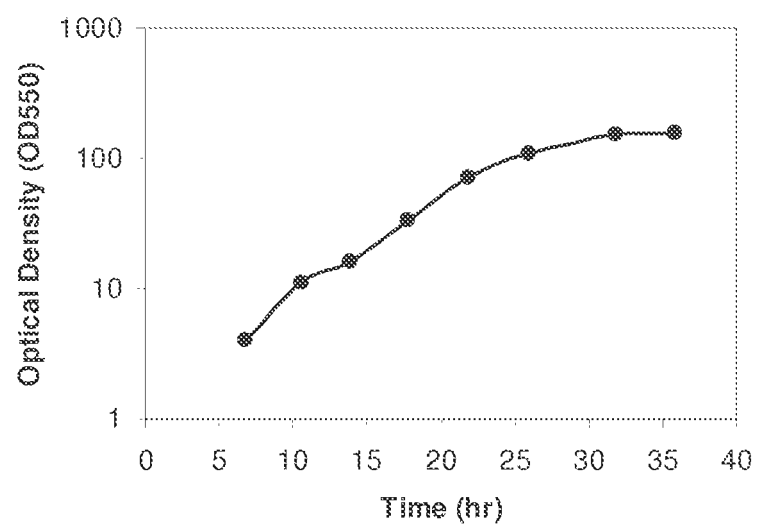


Figure 58

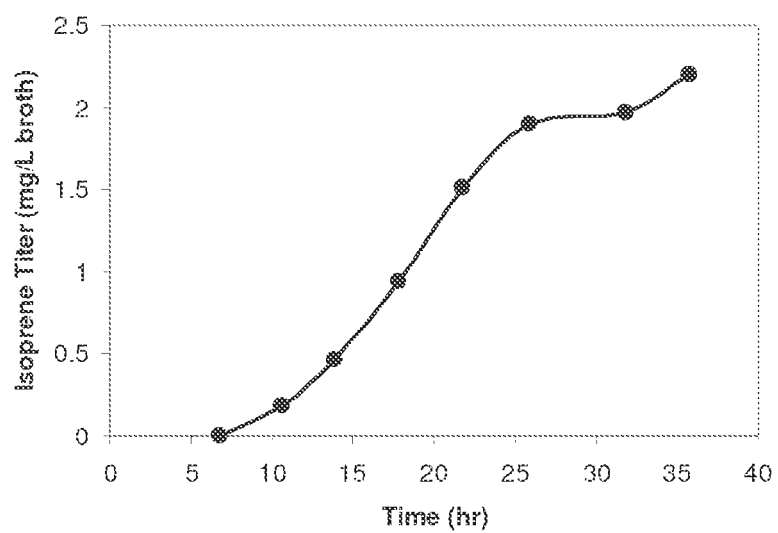


Figure 59

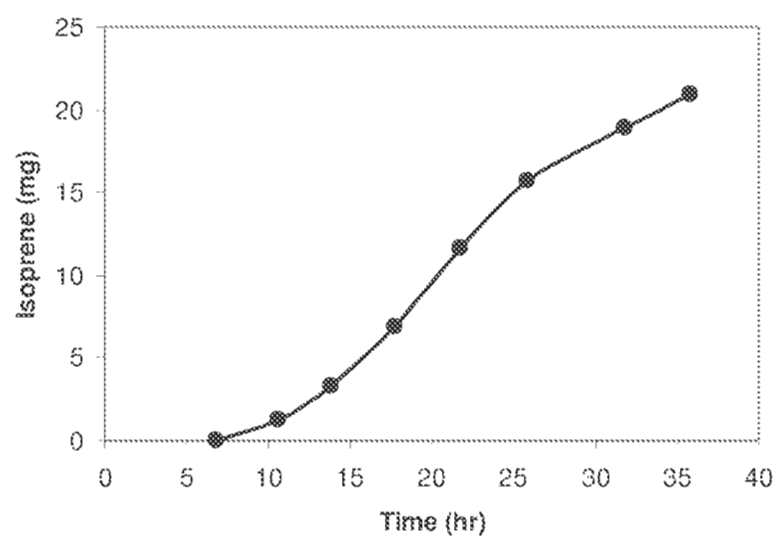


Figure 60A

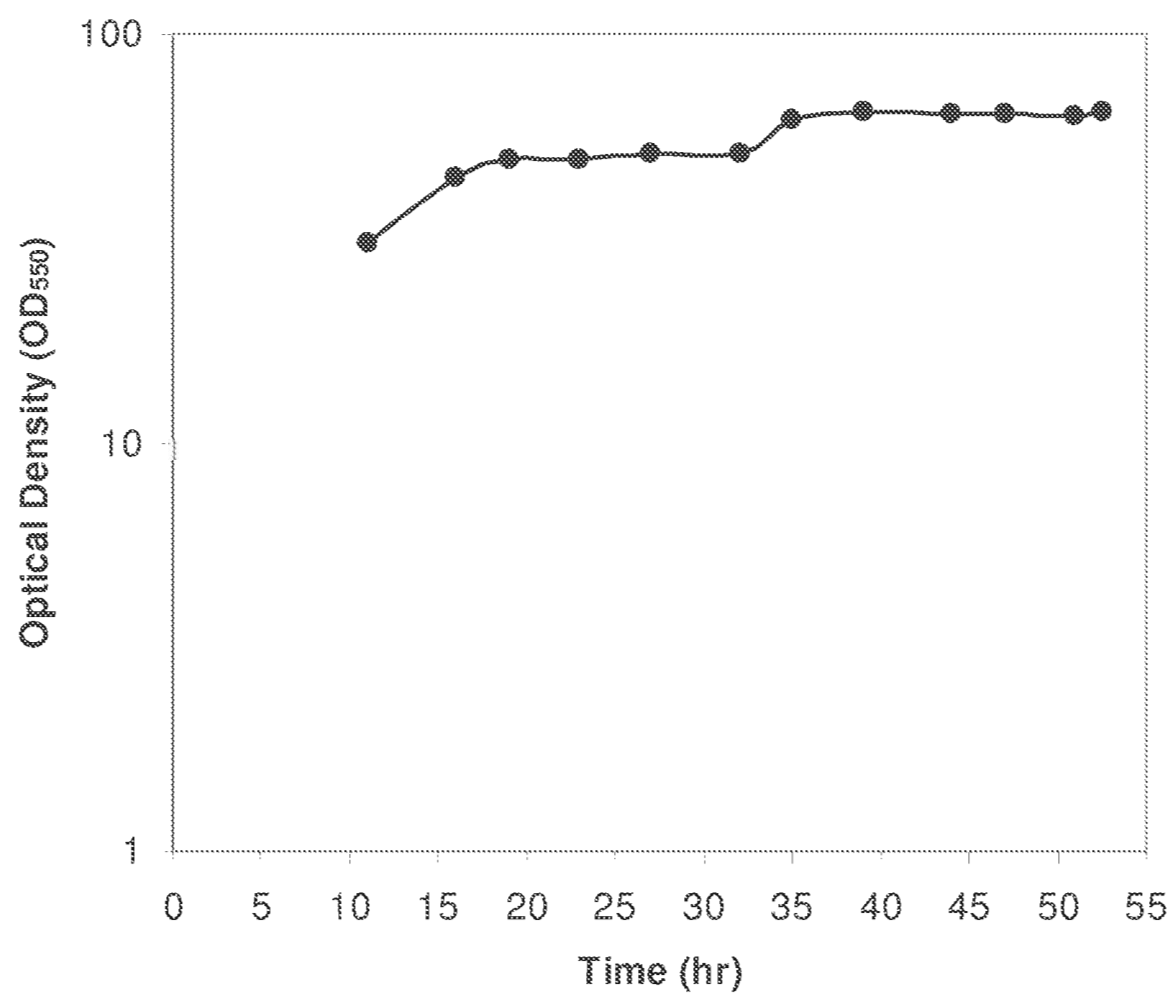


Figure 60B

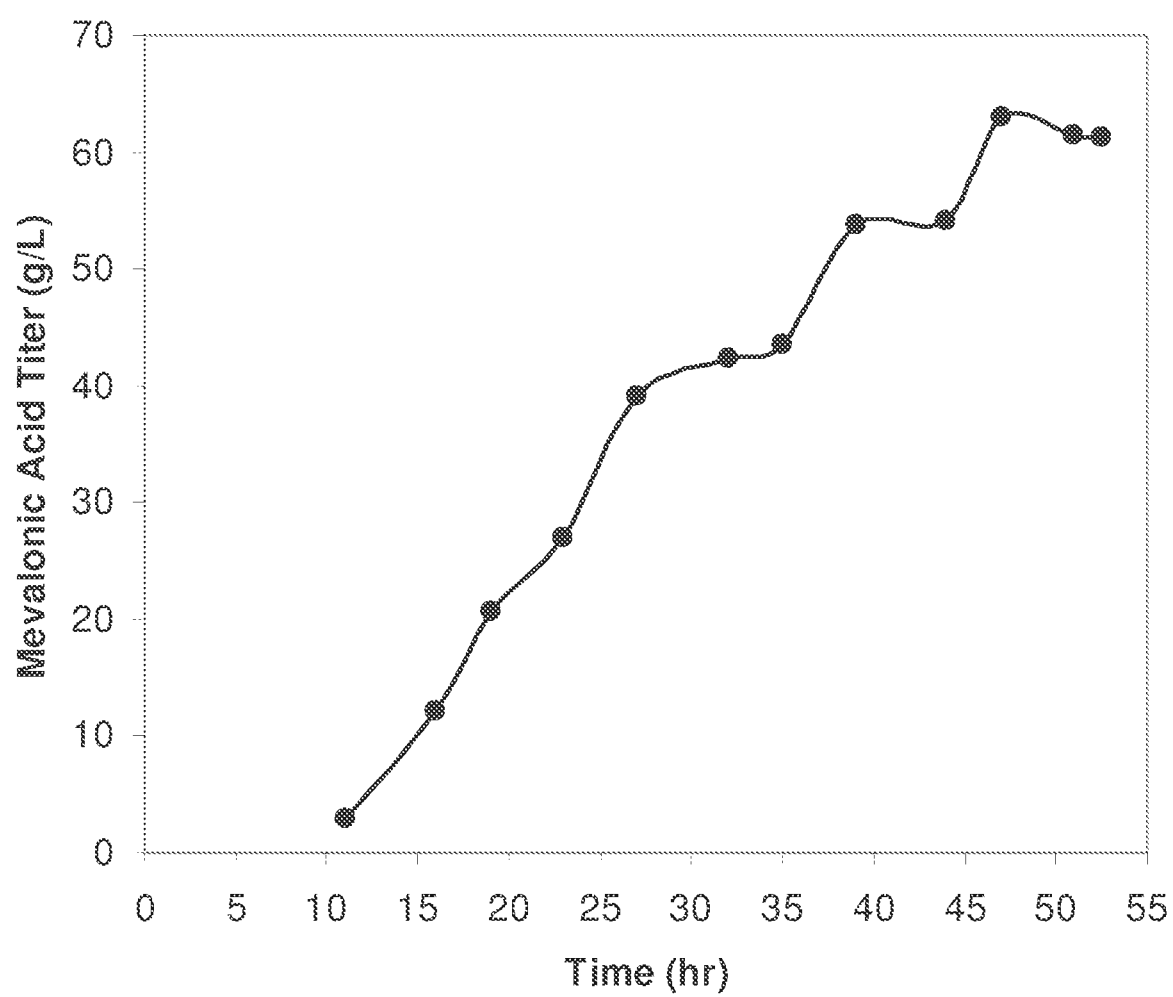


Figure 60C

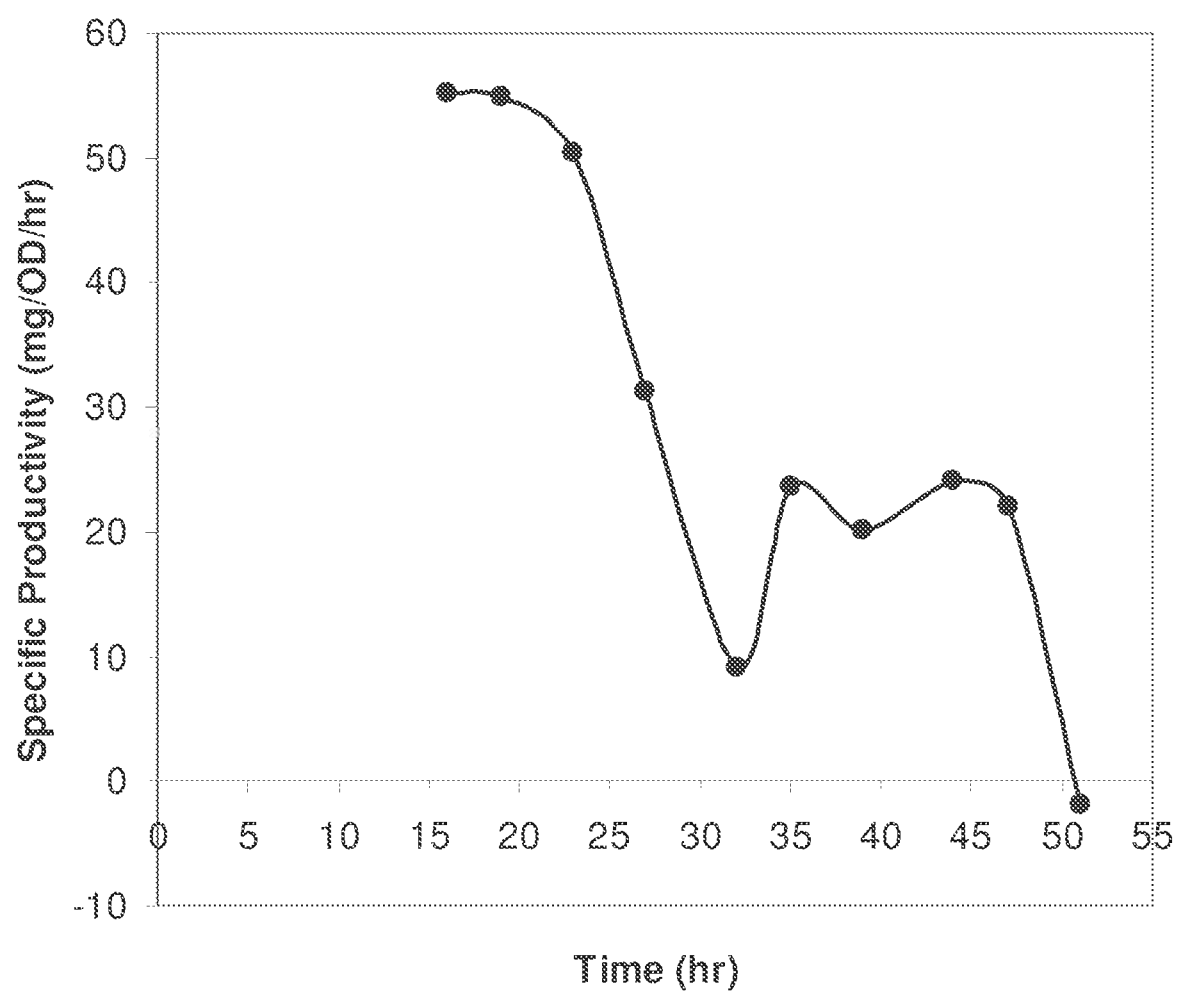


Figure 61A

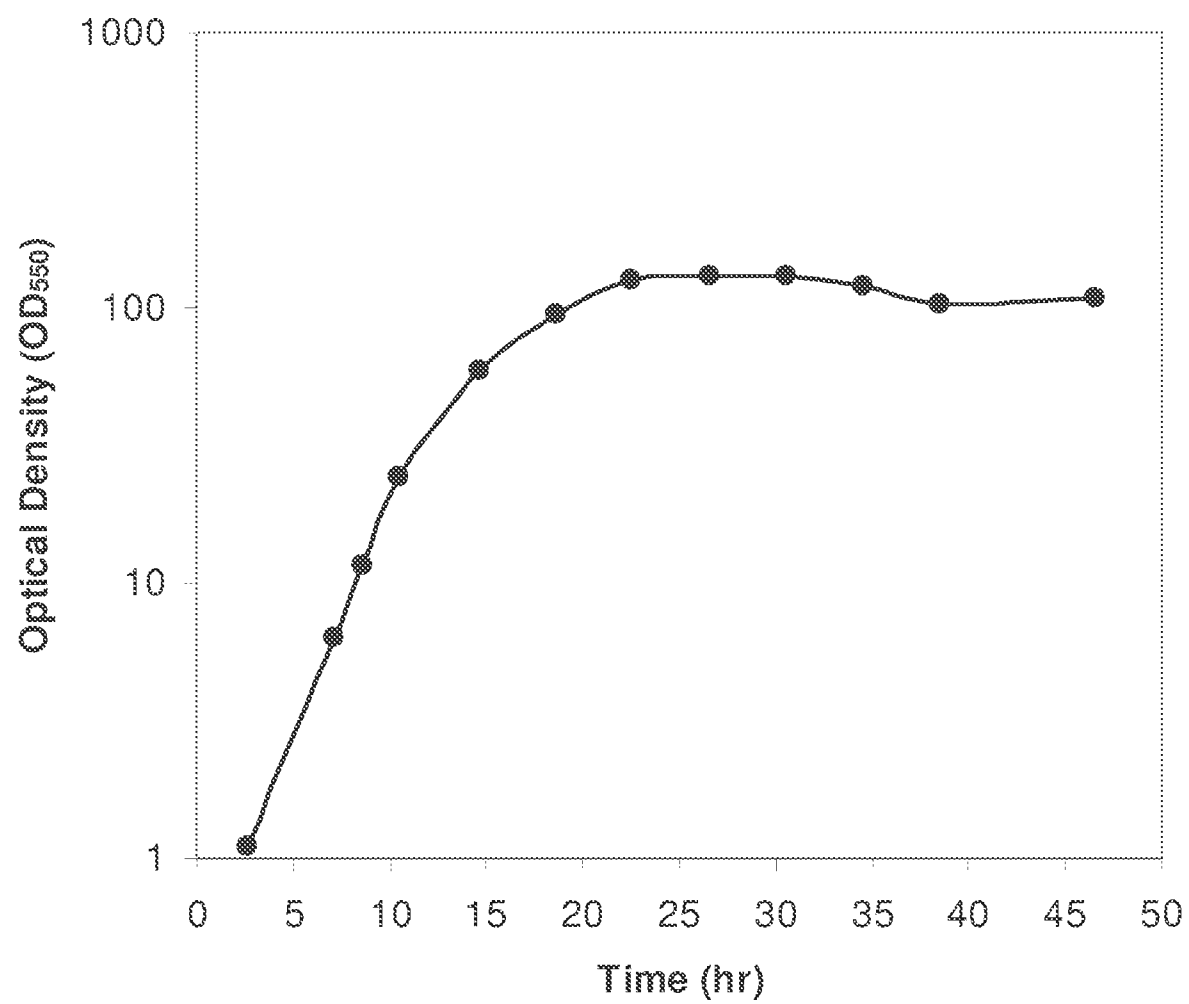


Figure 61B

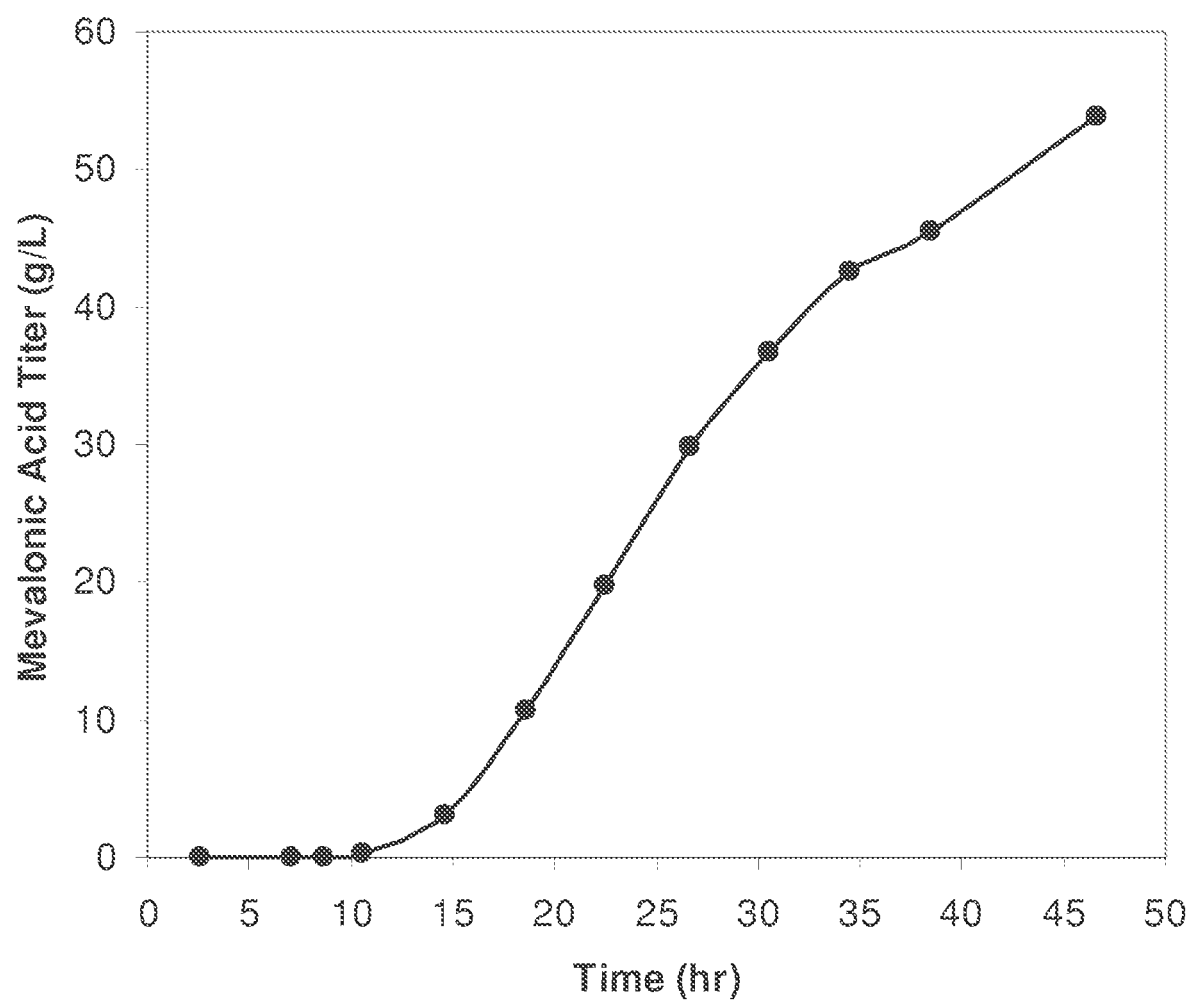


Figure 61C

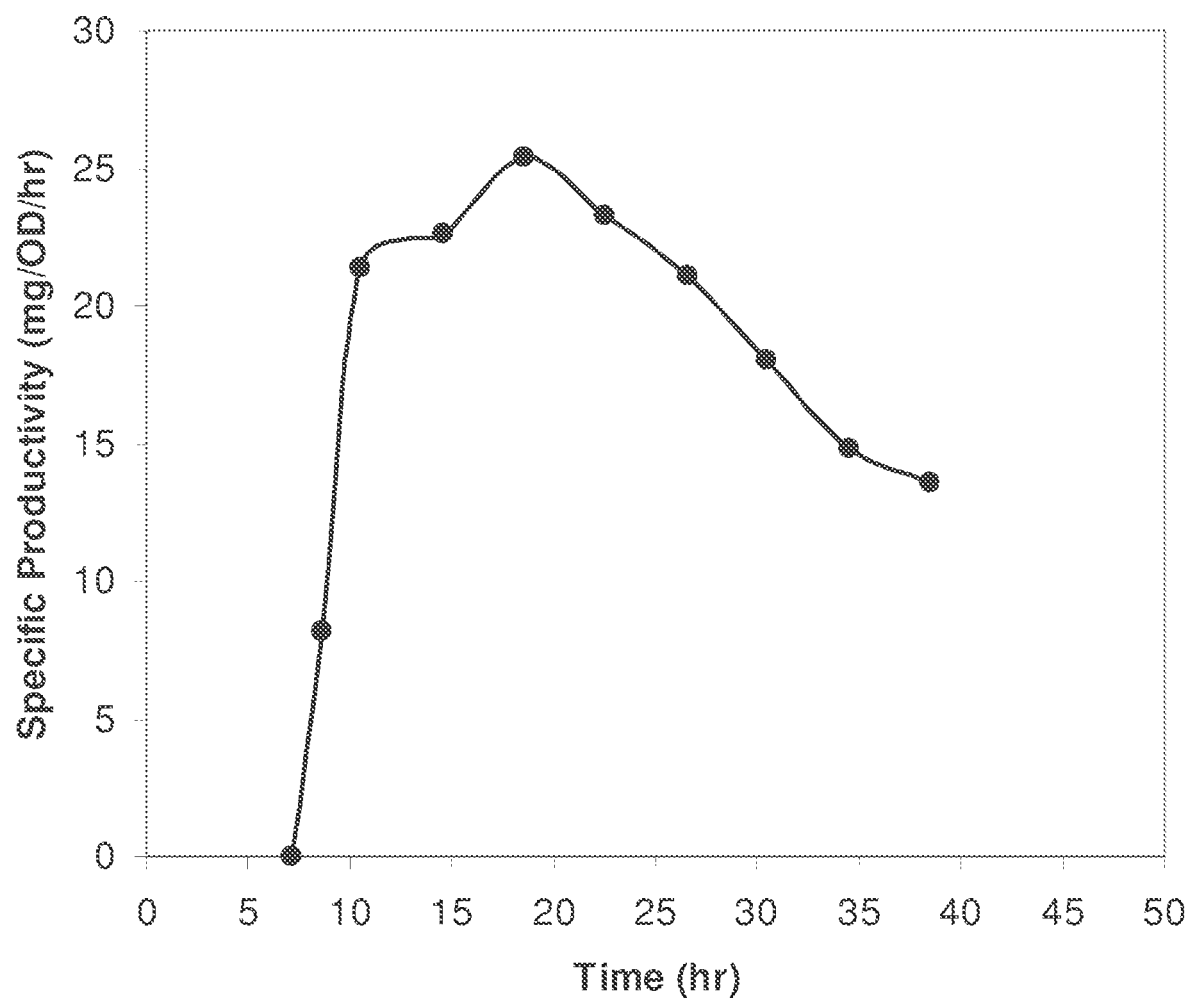


Figure 62A

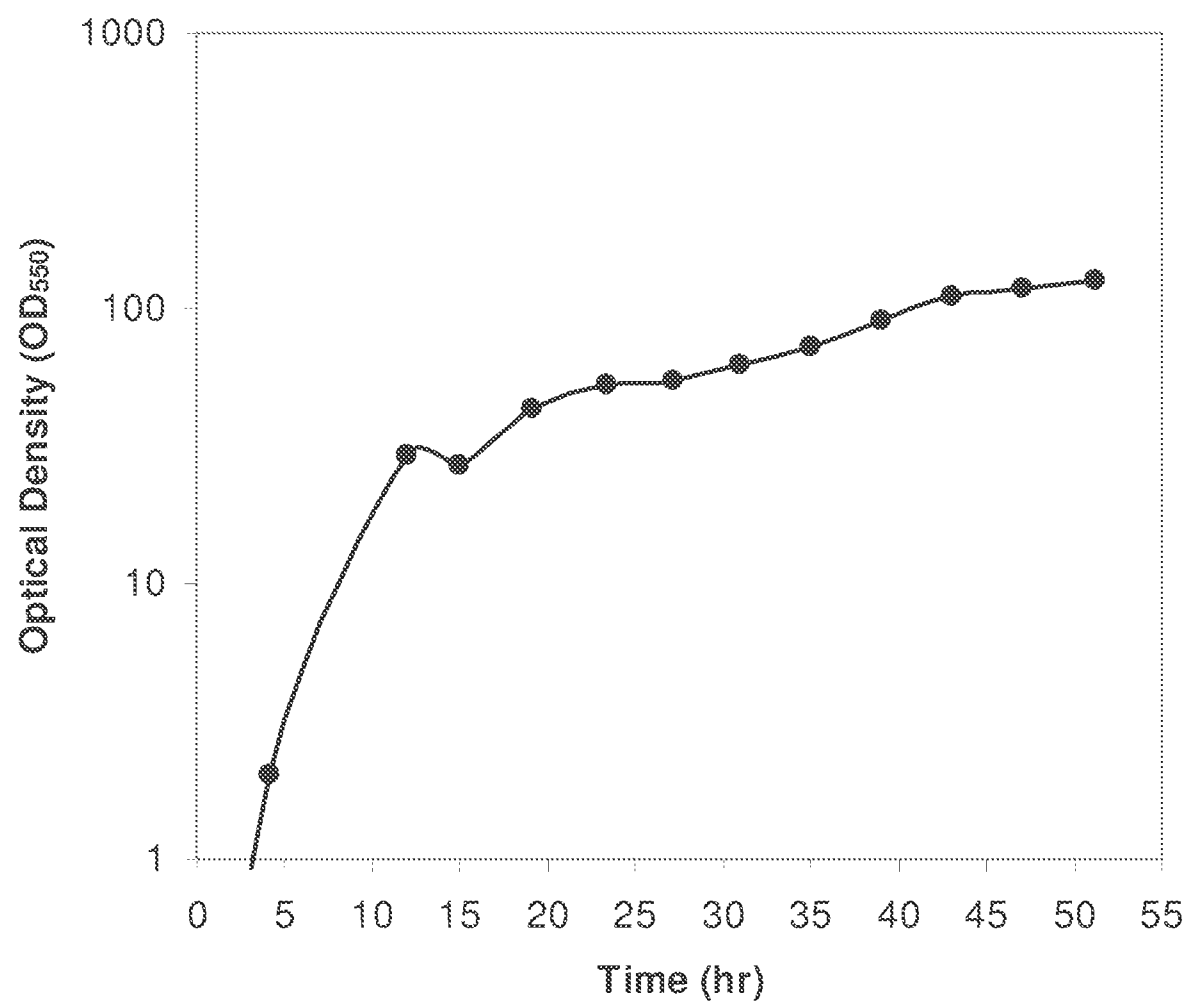


Figure 62B

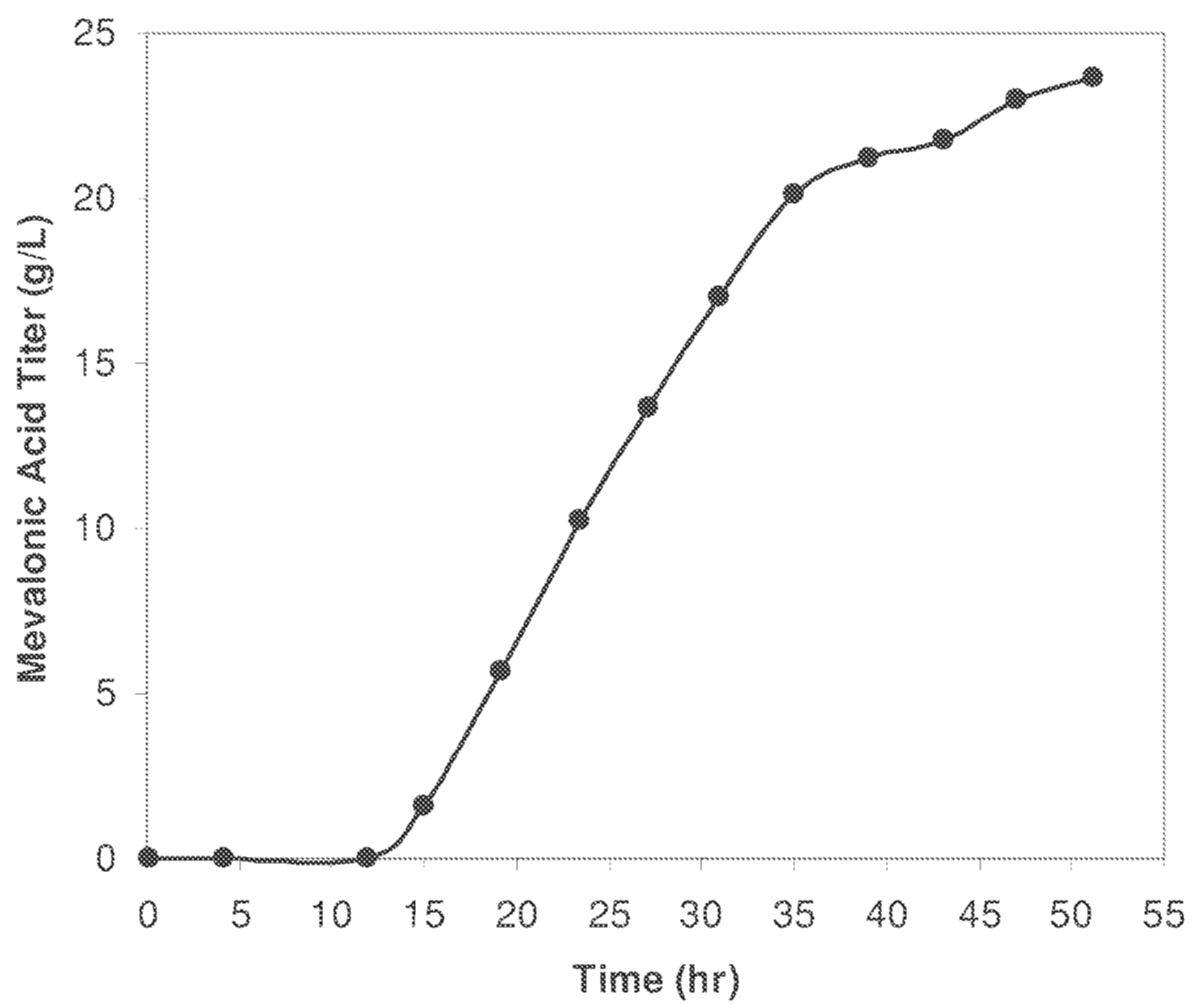


Figure 62C

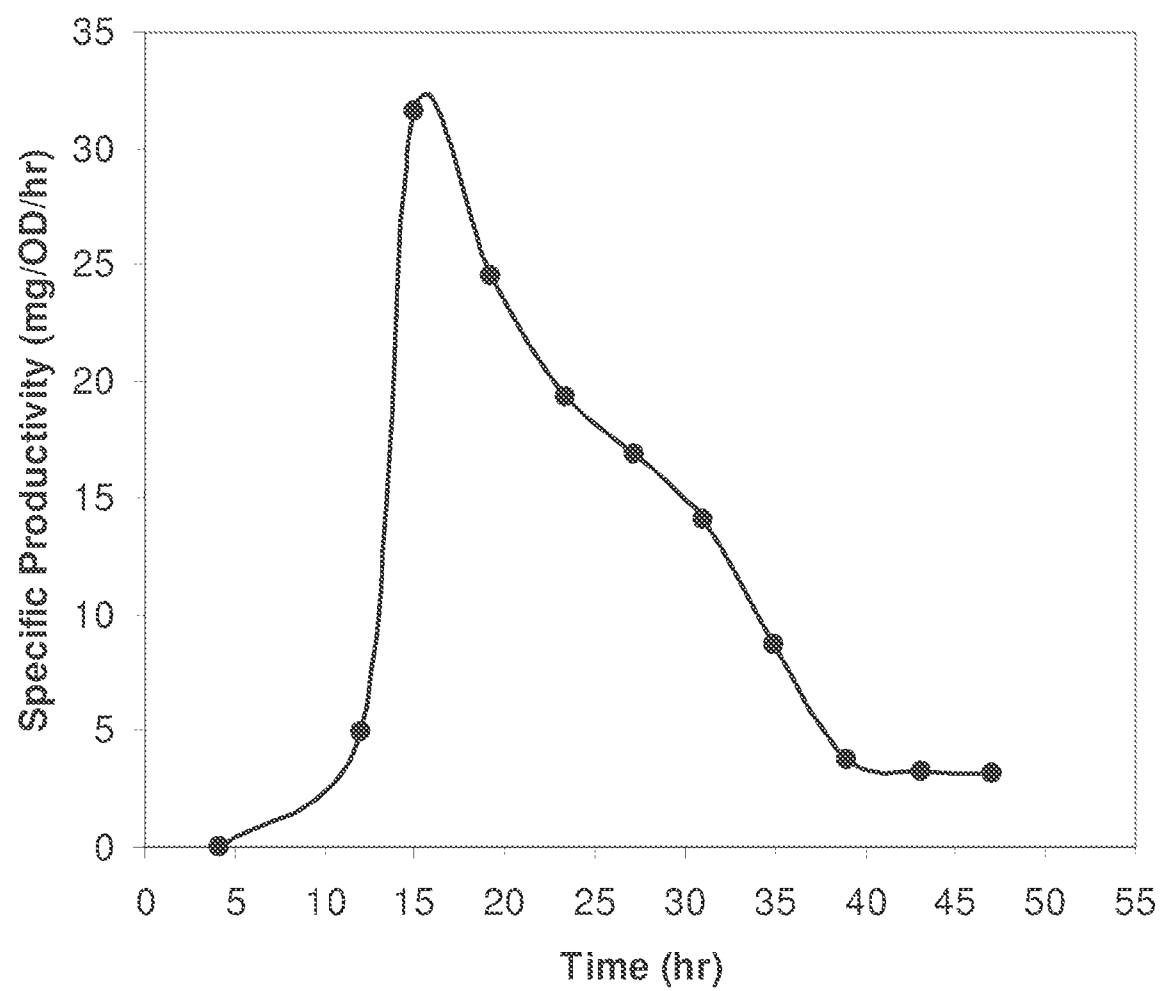


Figure 63A

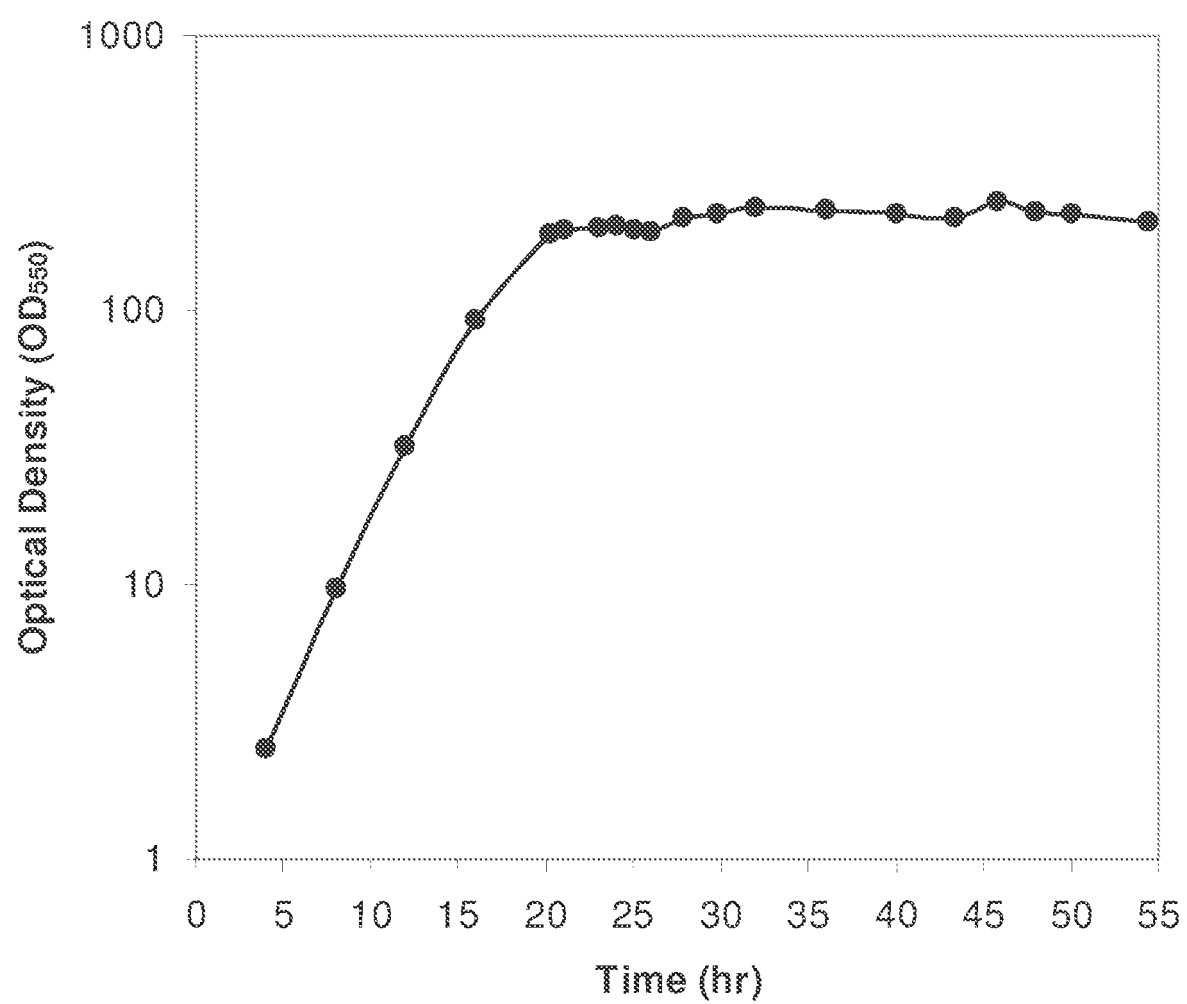


Figure 63B

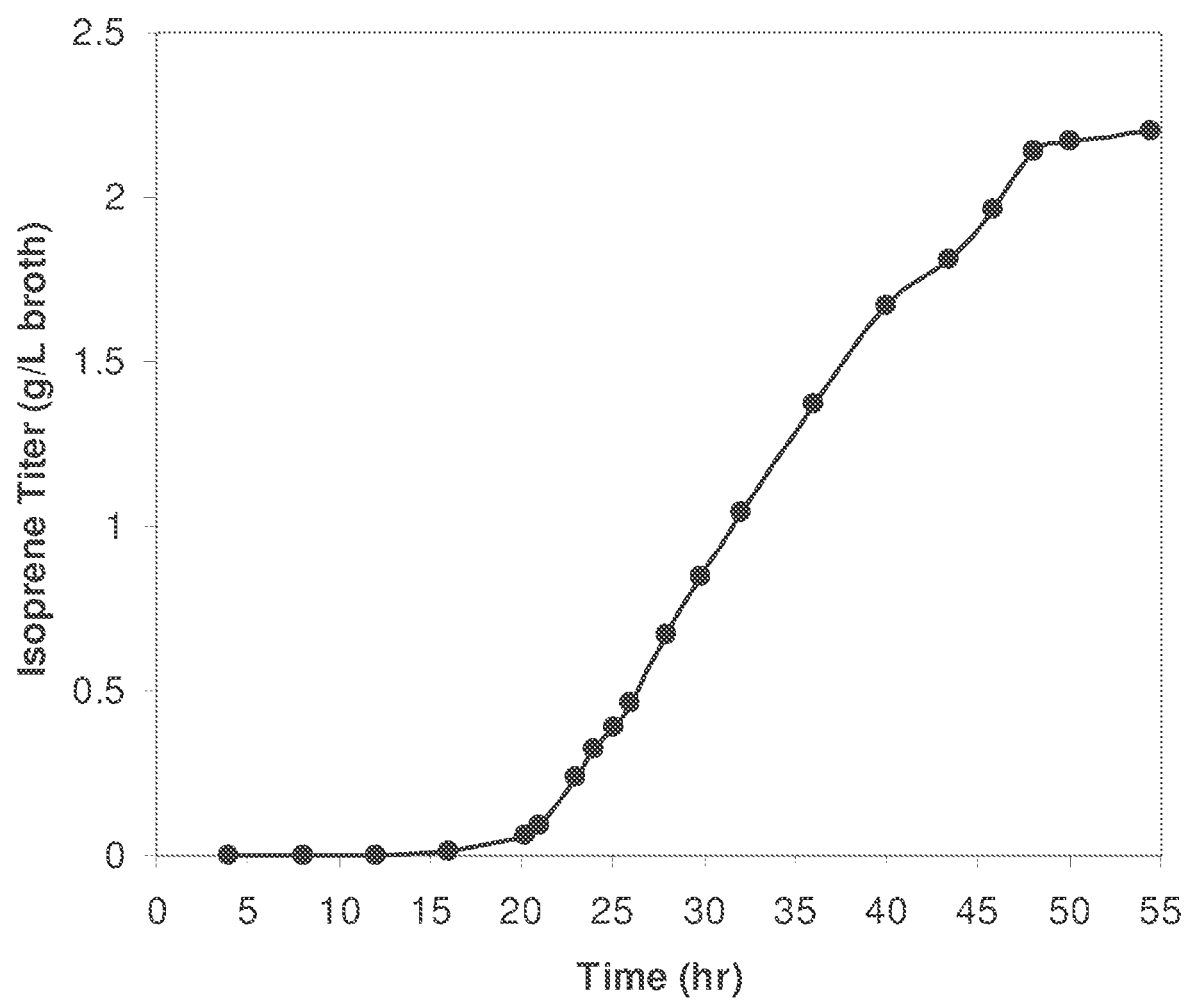


Figure 63C

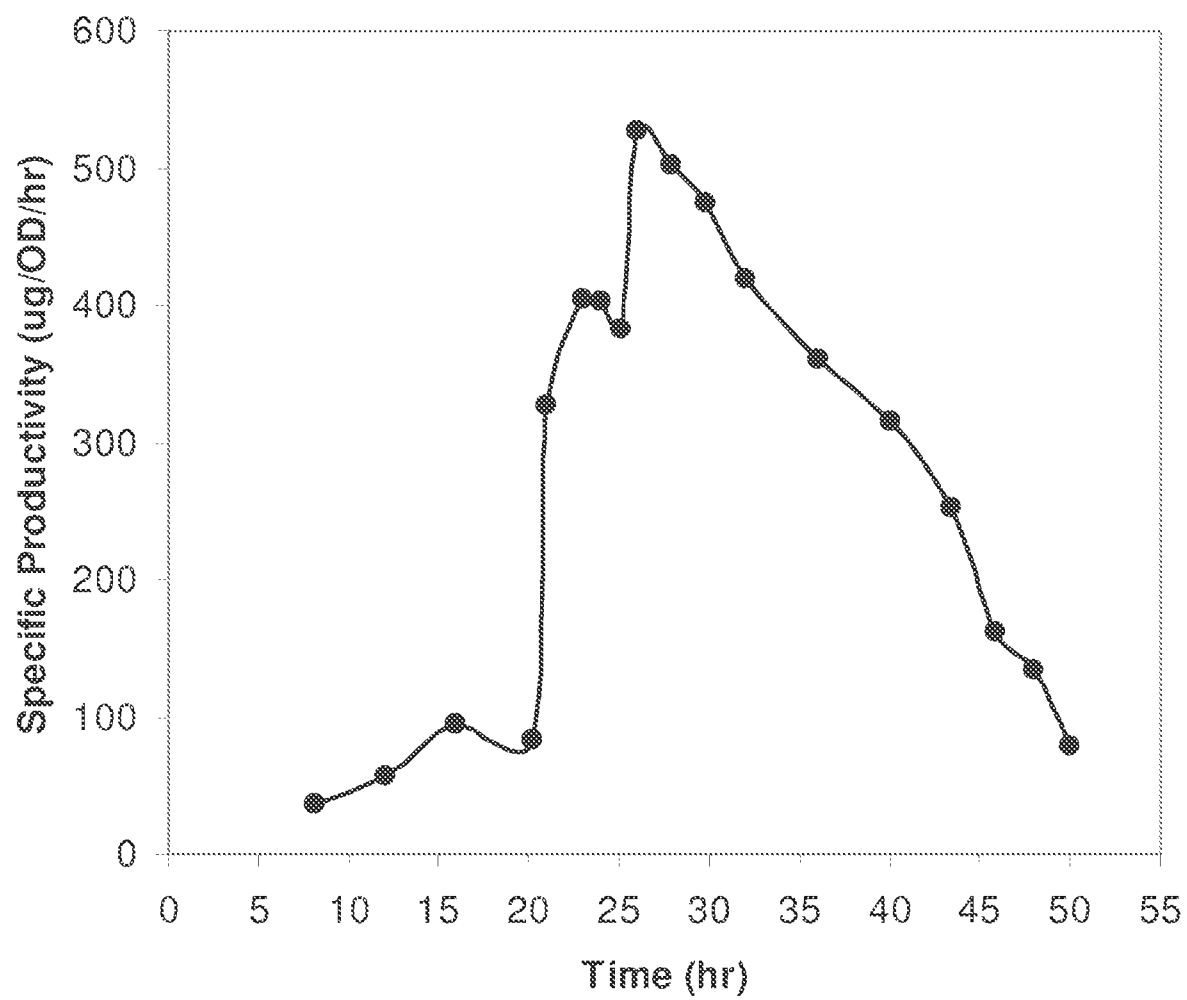


Figure 64A

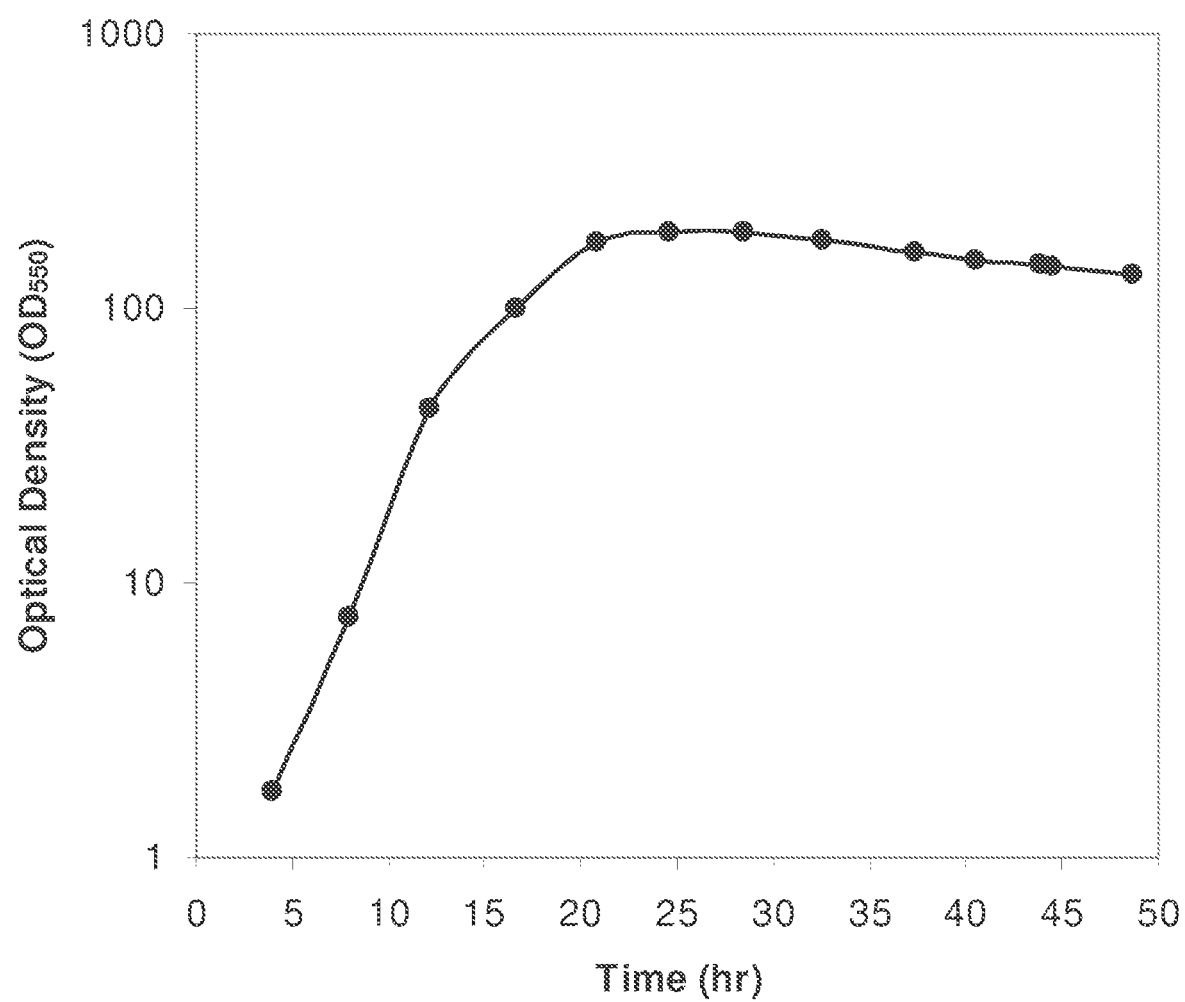


Figure 64B

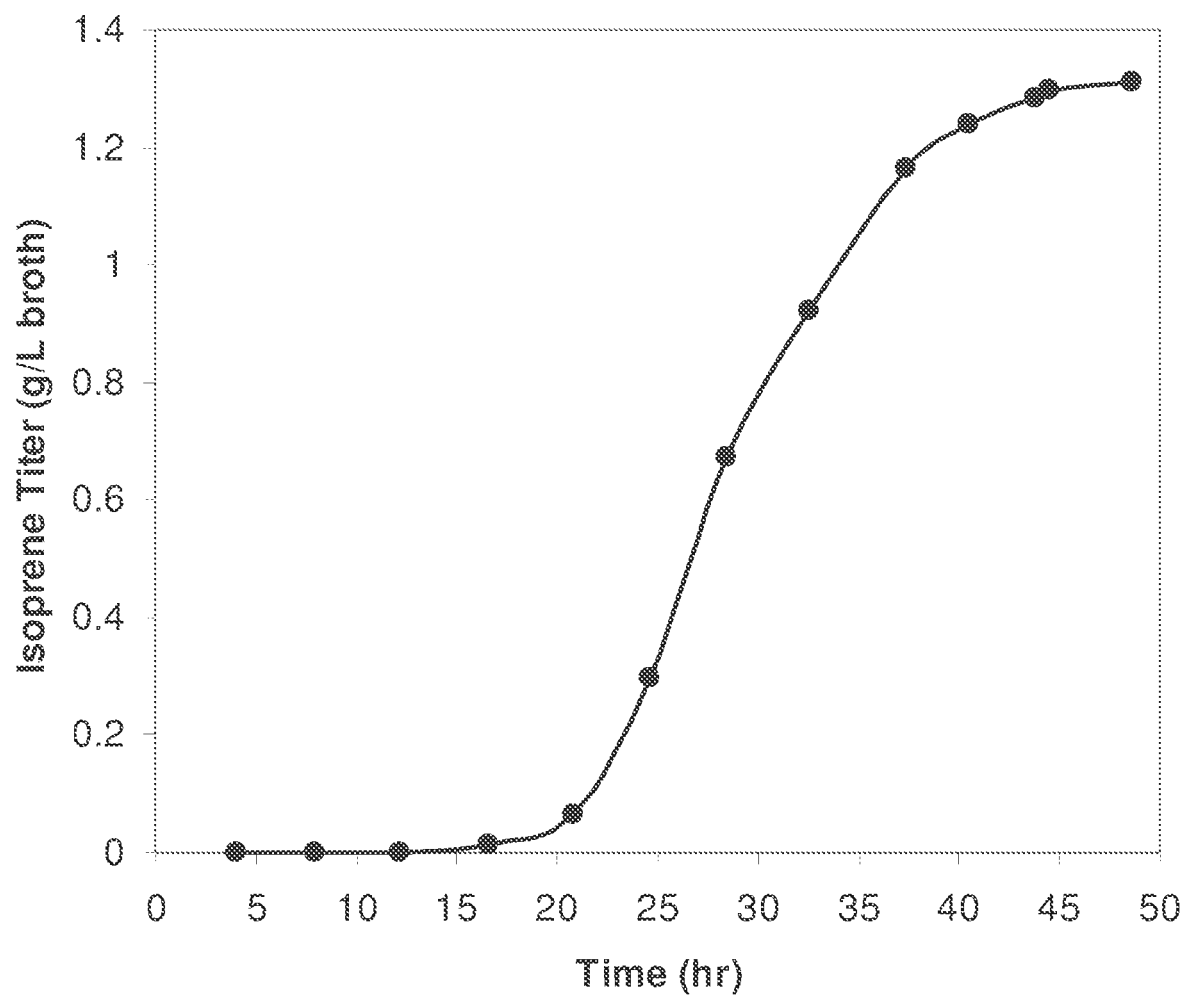


Figure 64C

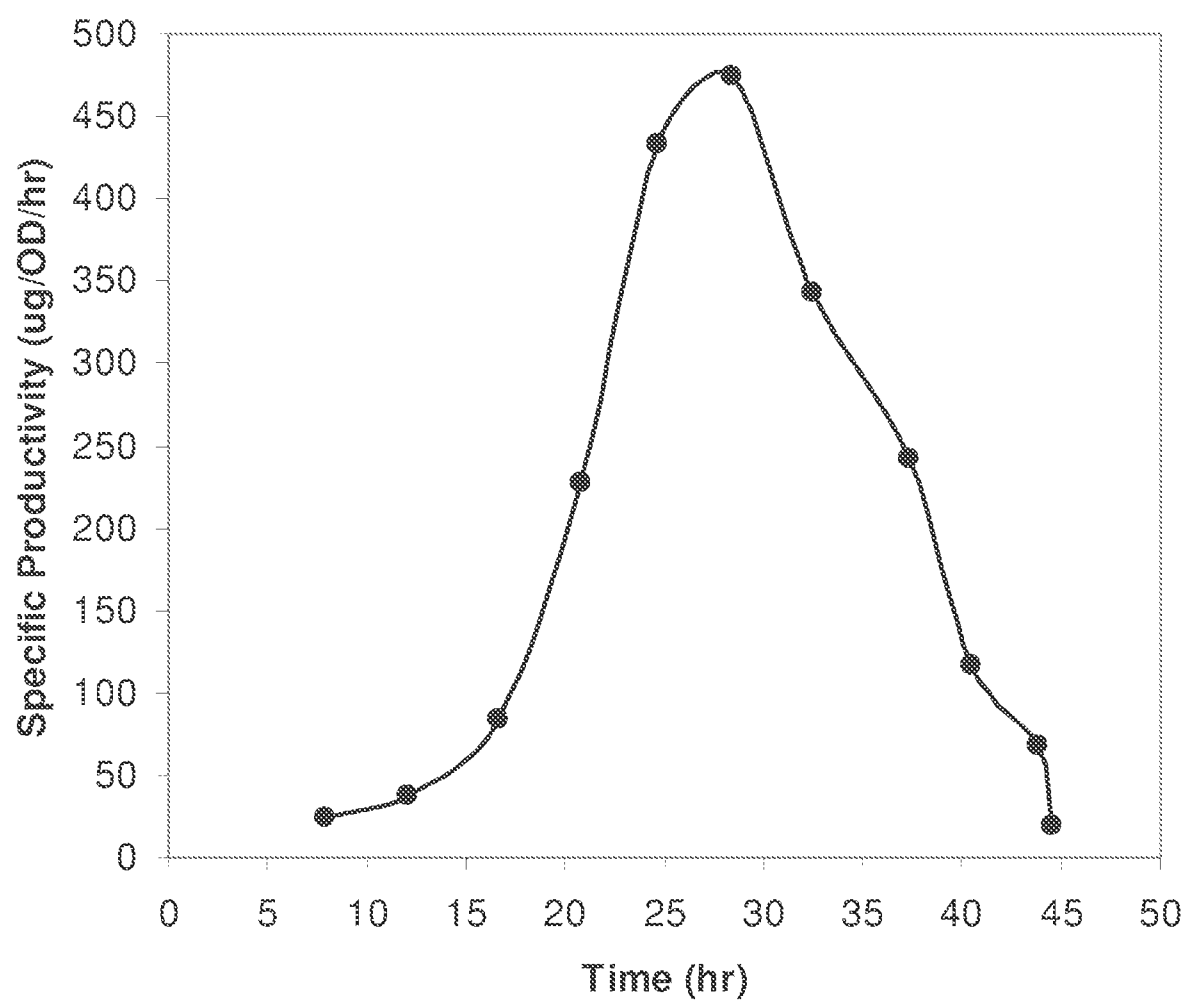


Figure 65A

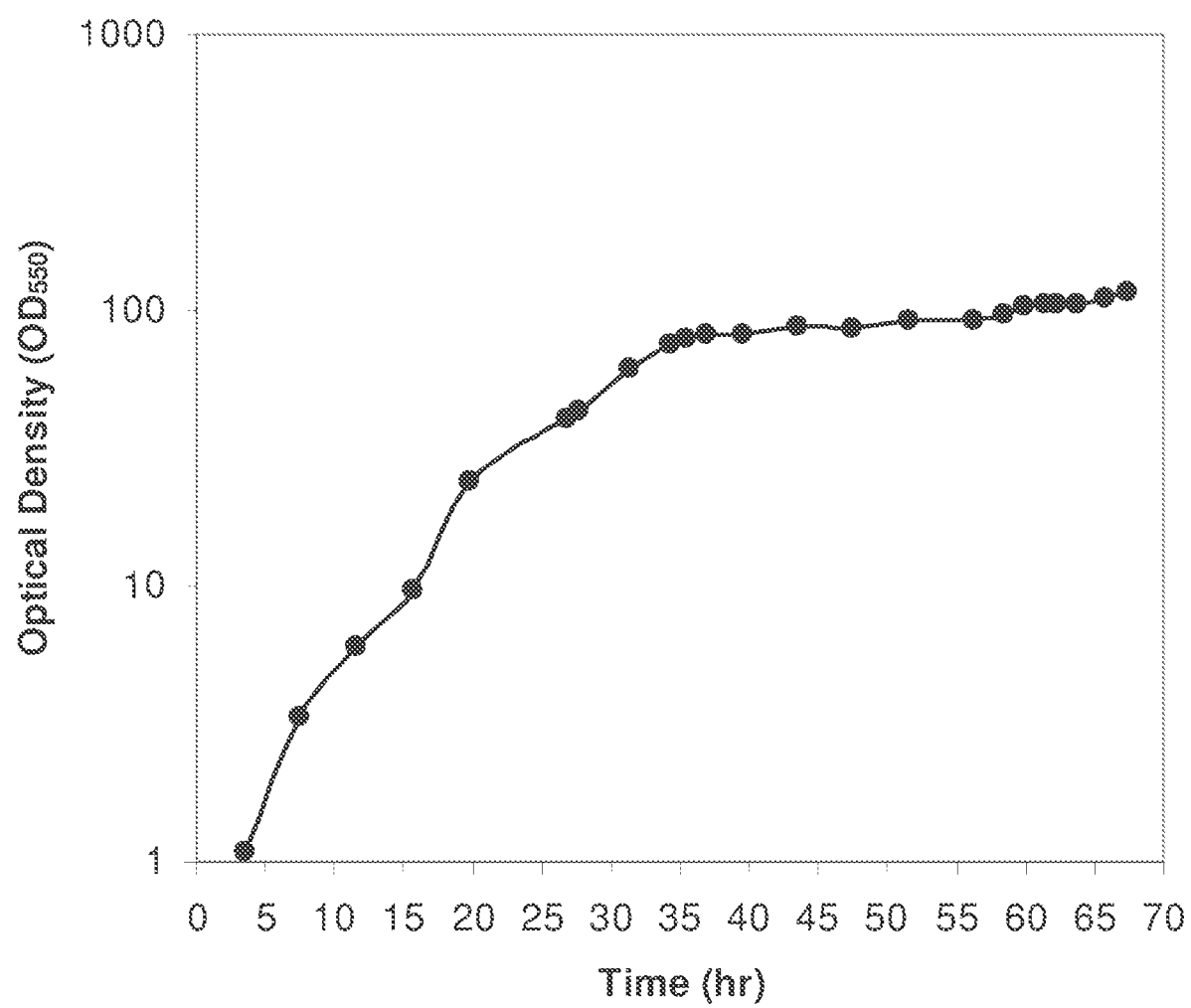


Figure 65B

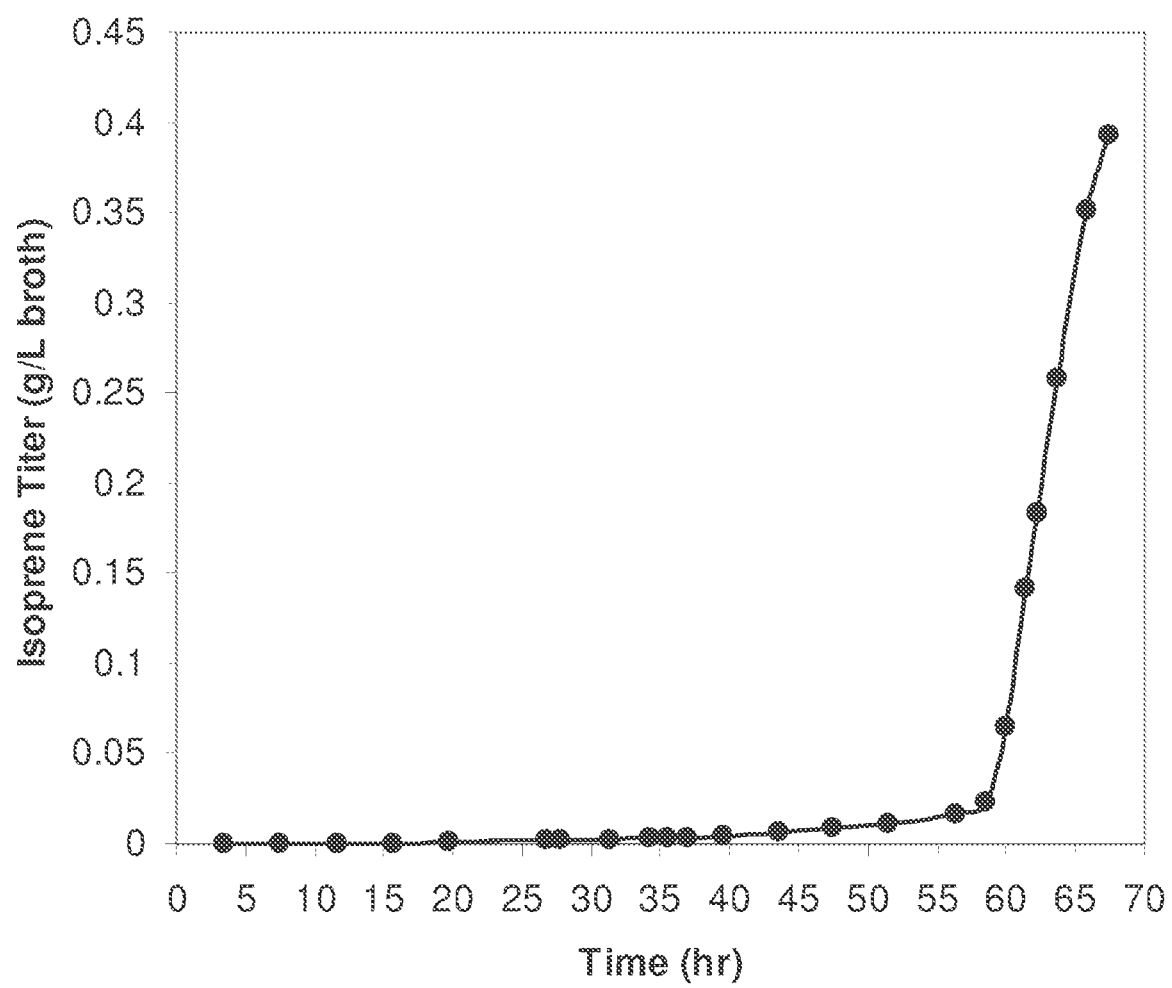


Figure 65C

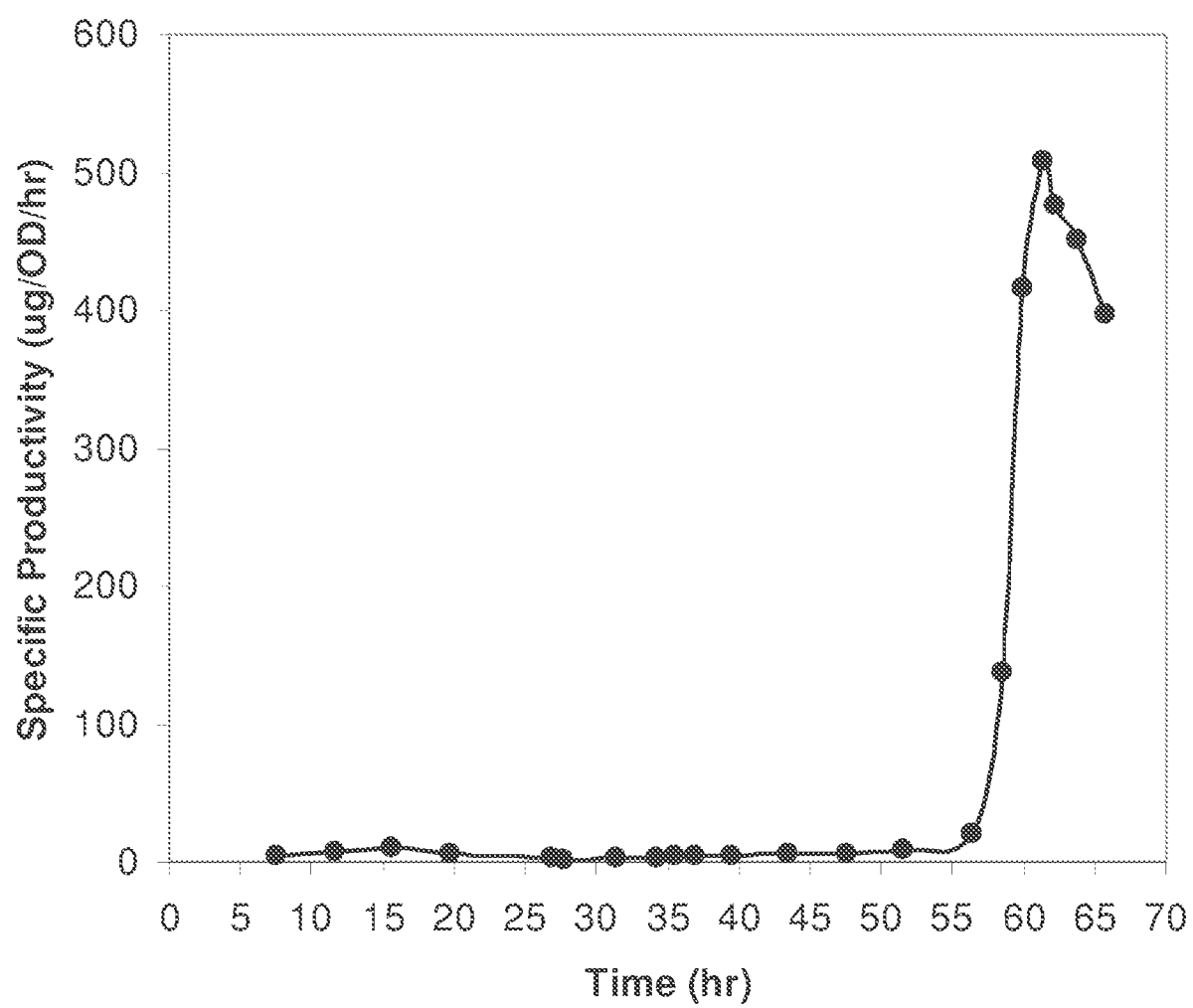


Figure 66A

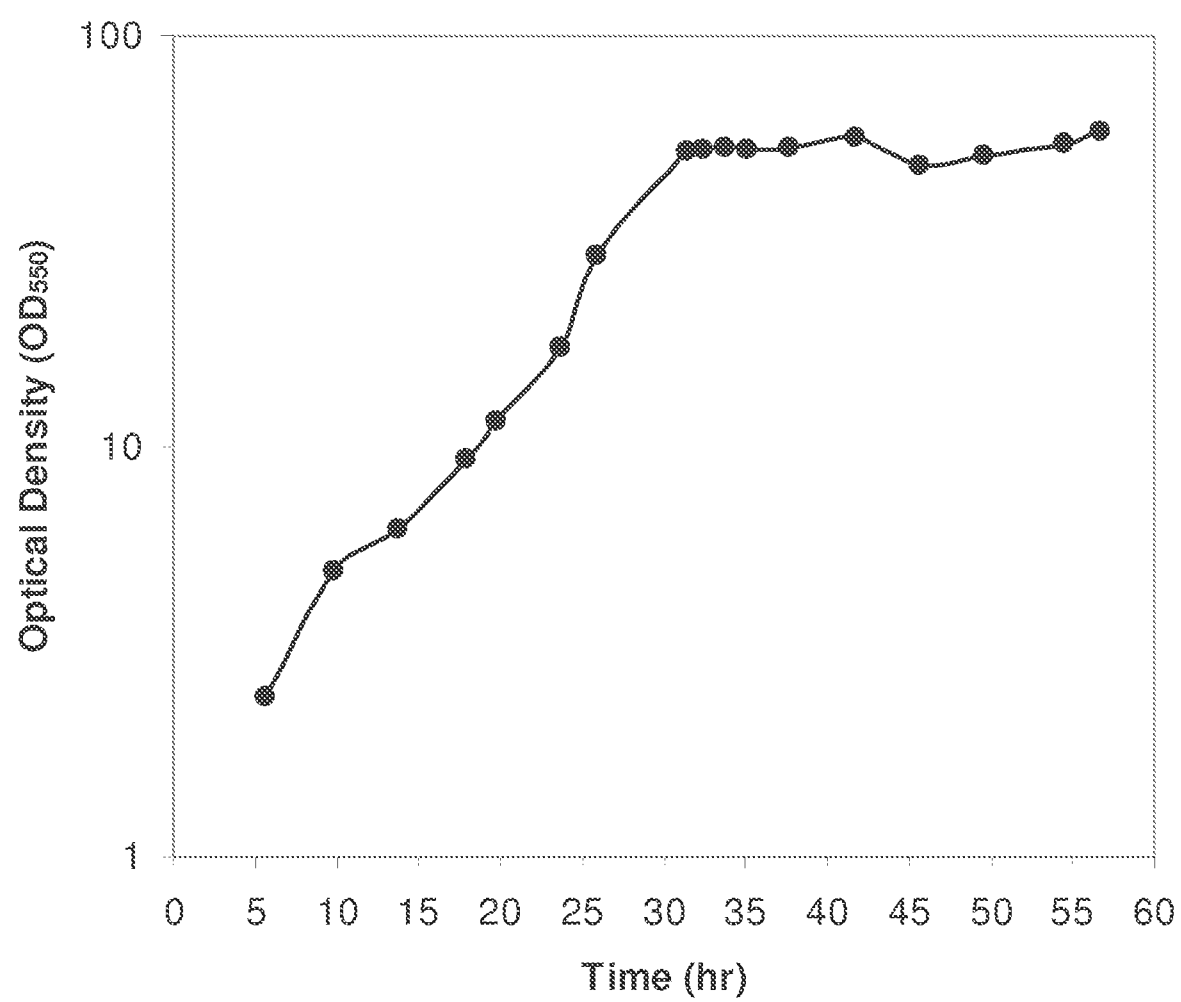


Figure 66B

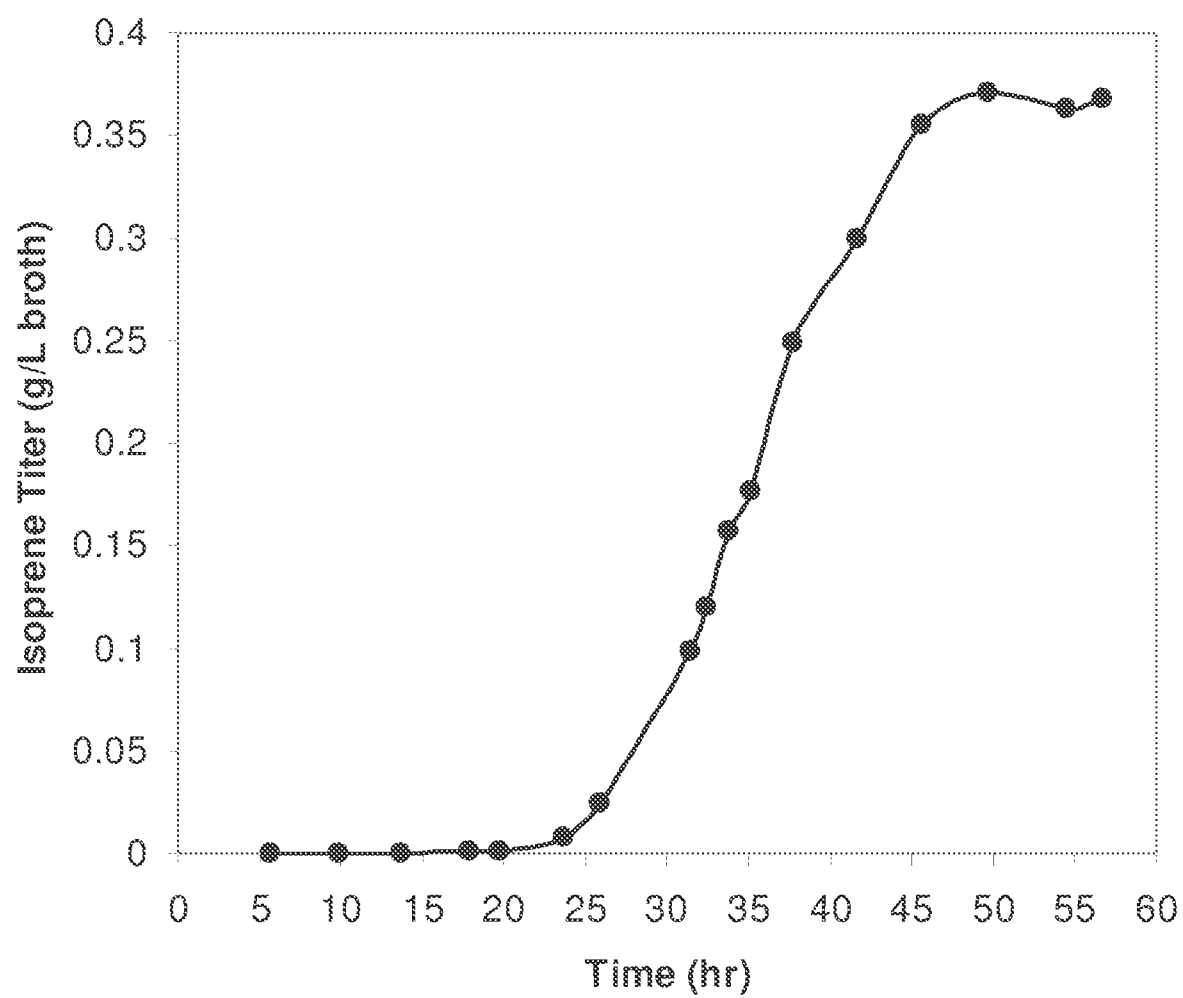


Figure 66C

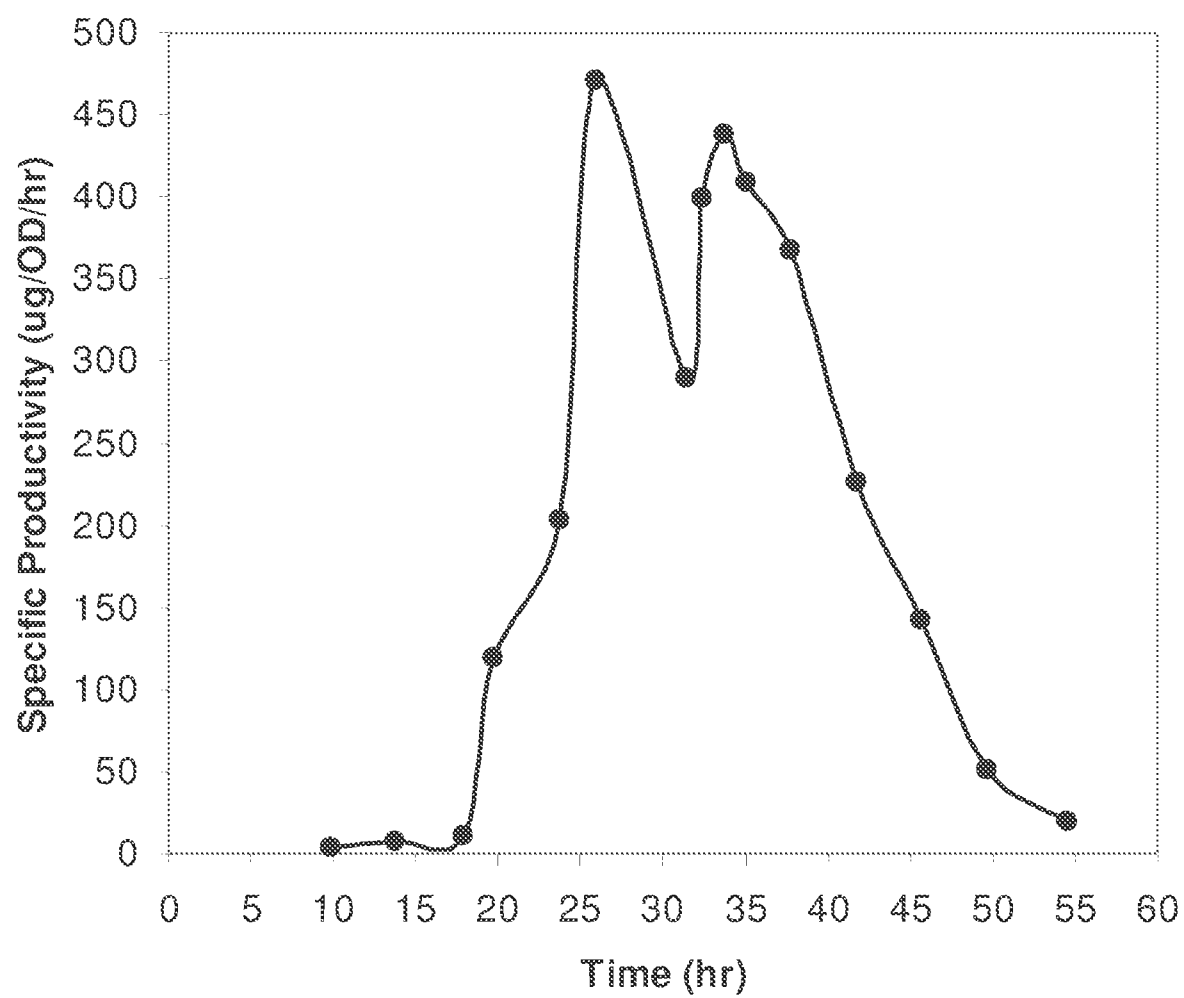


Figure 67A

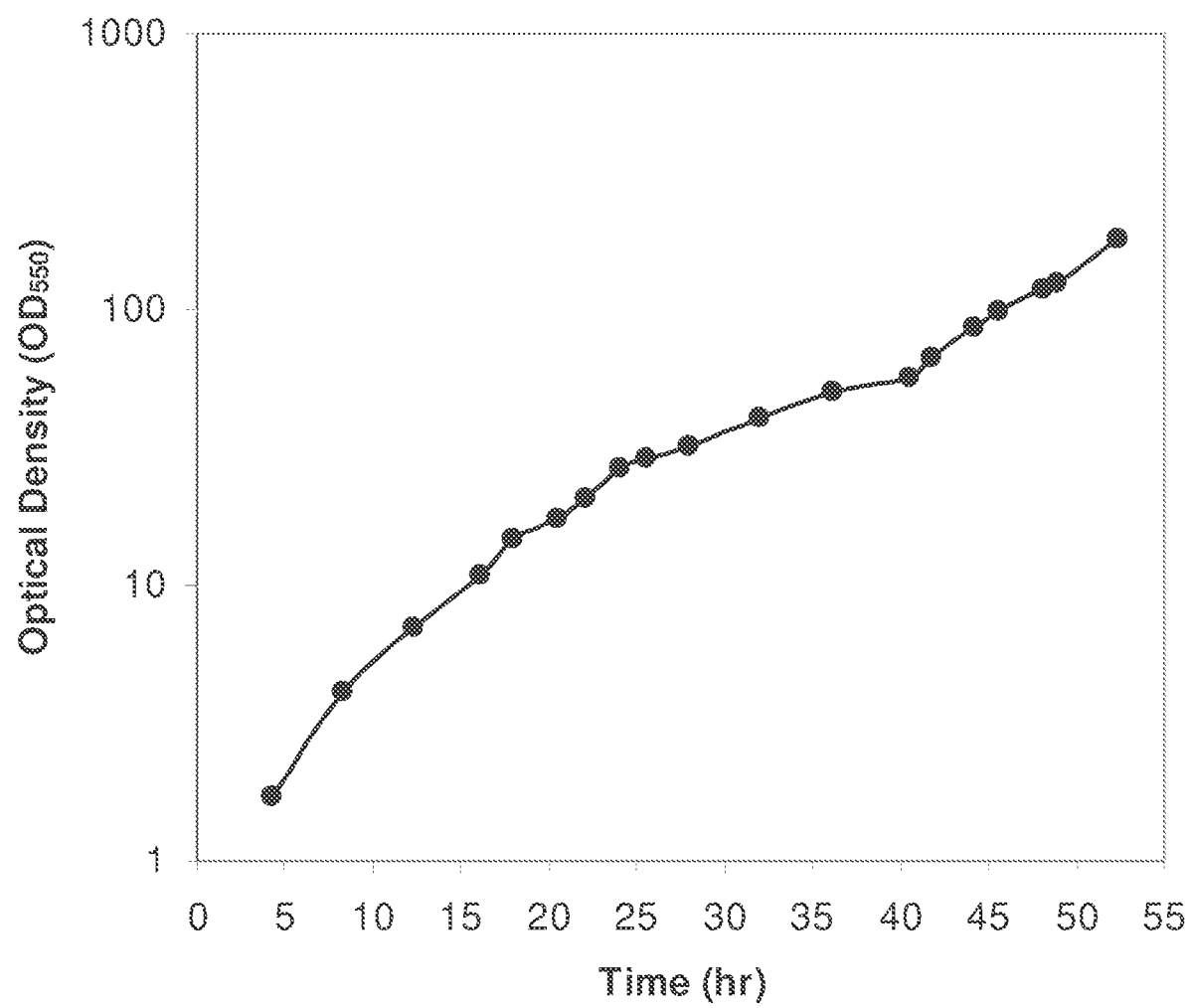


Figure 67B

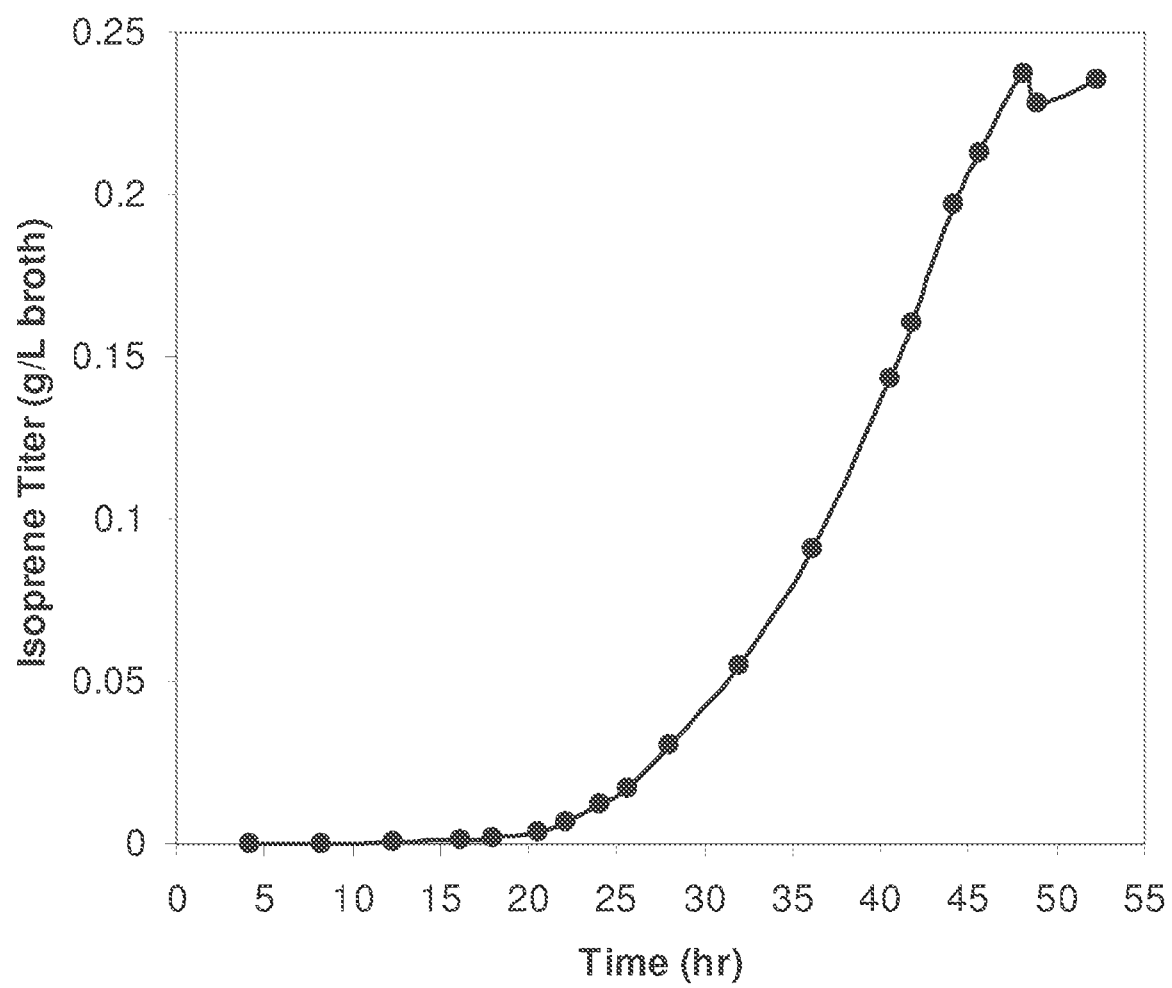


Figure 67C

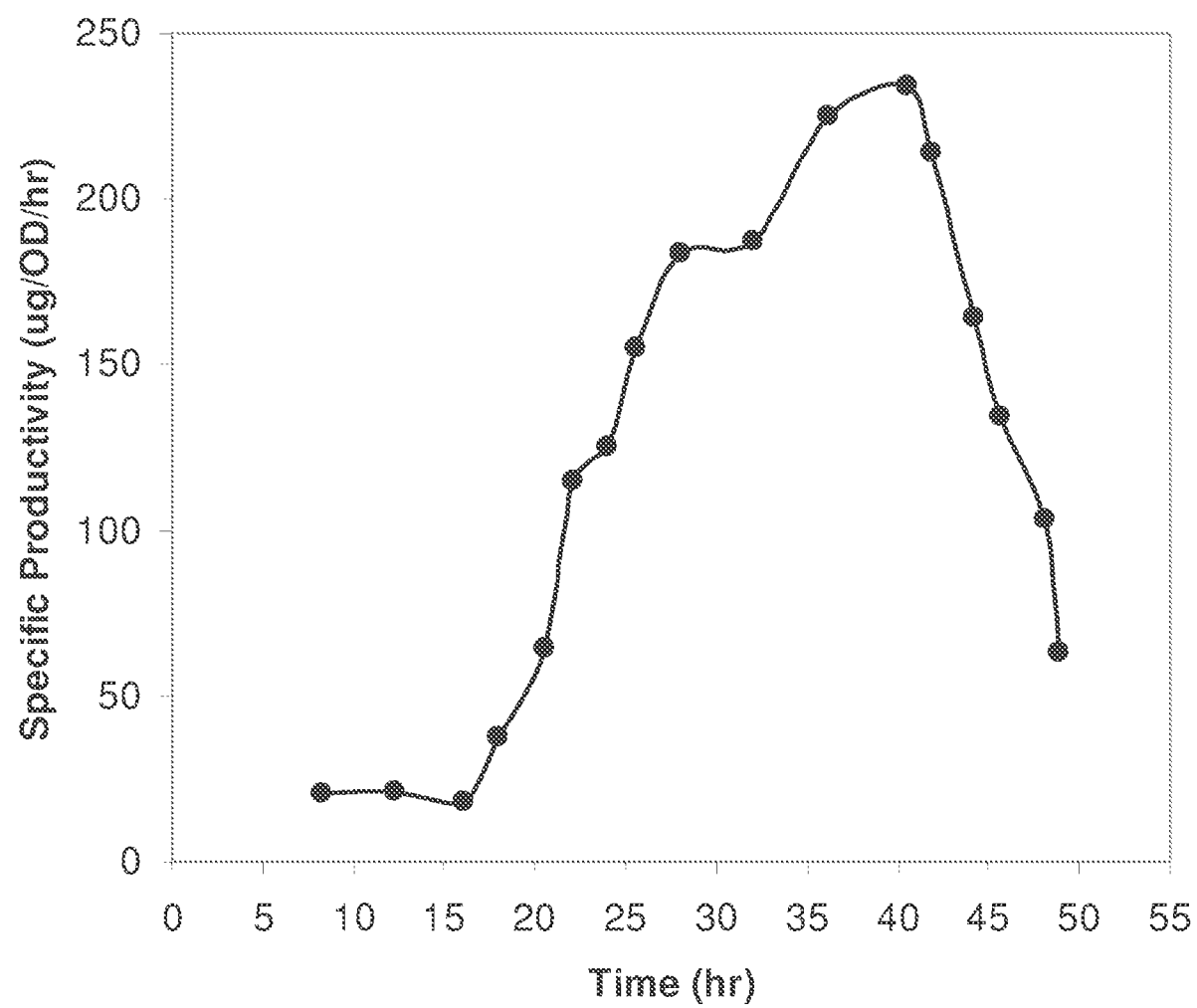


Figure 69

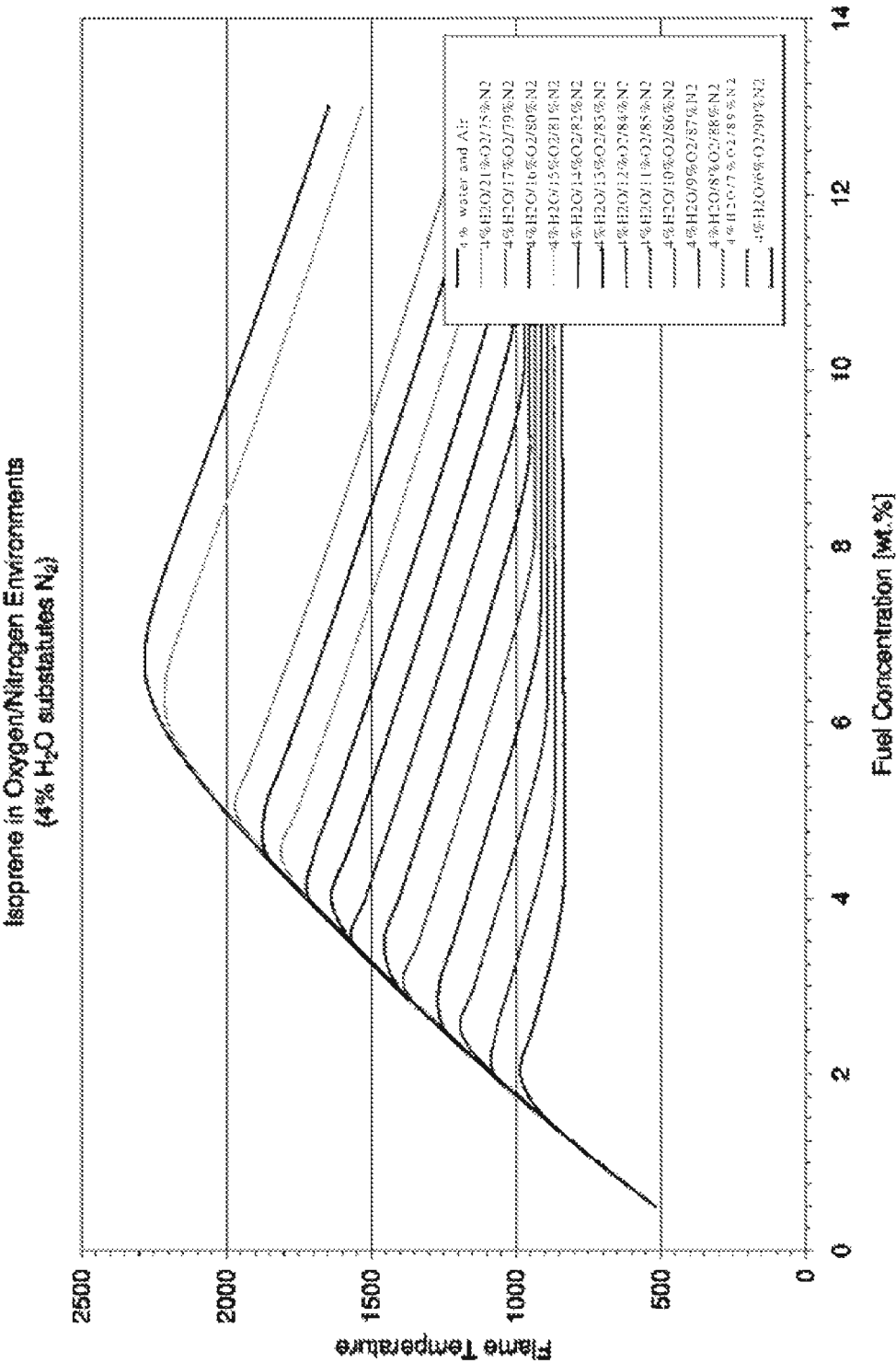


Figure 70

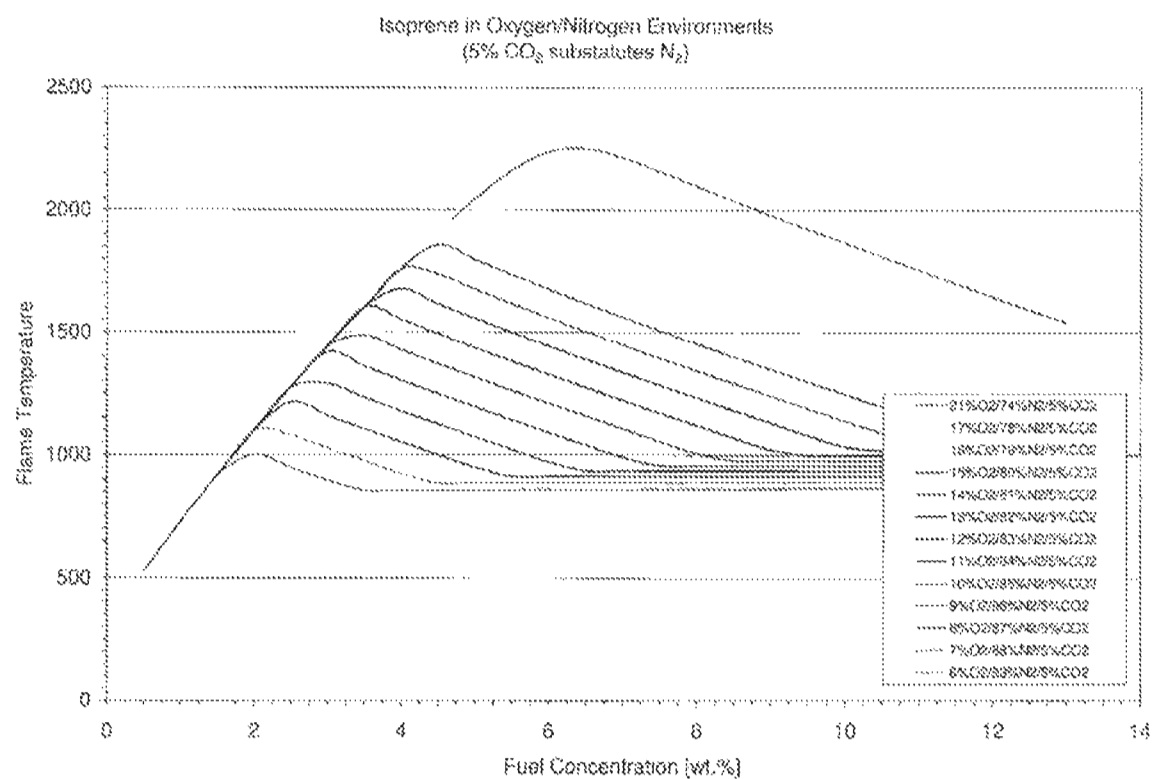


Figure 71

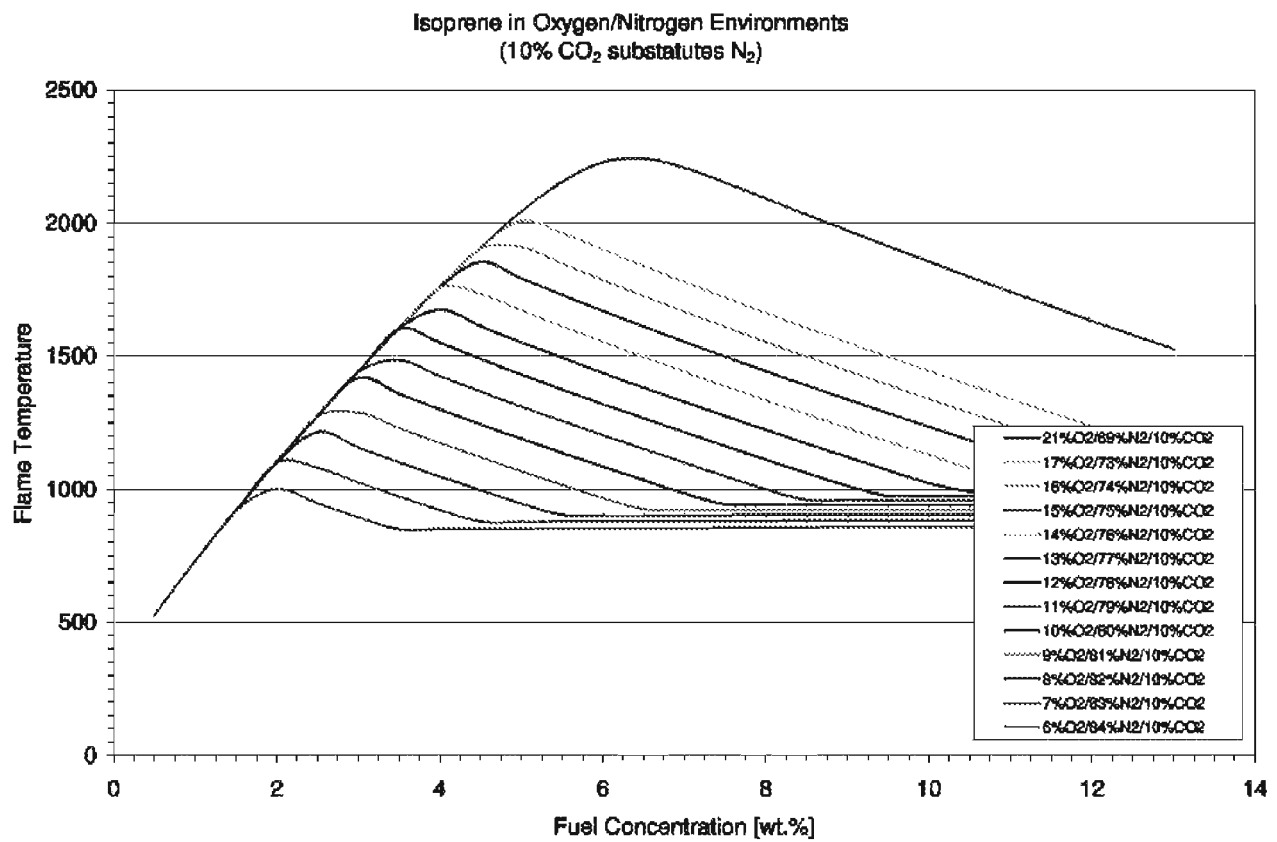


Figure 72

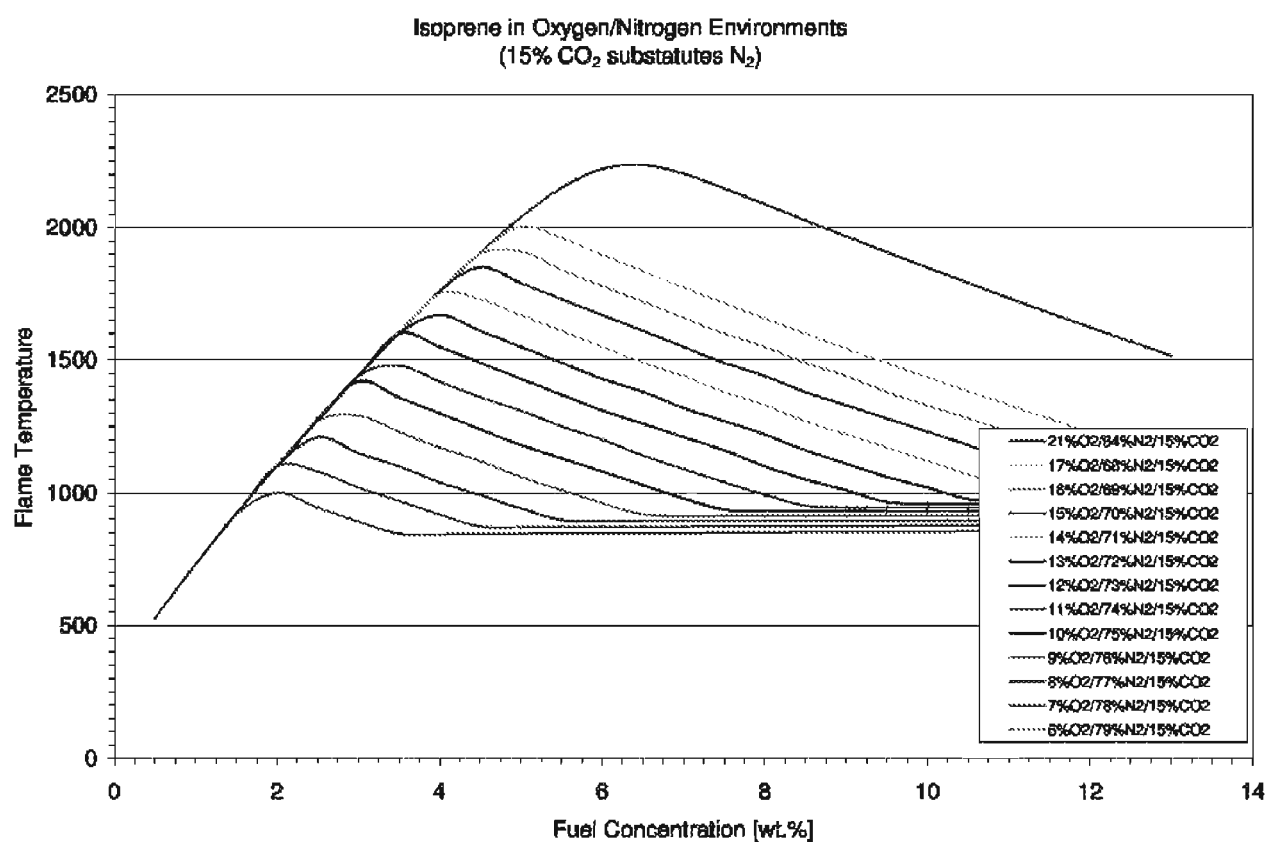


Figure 73

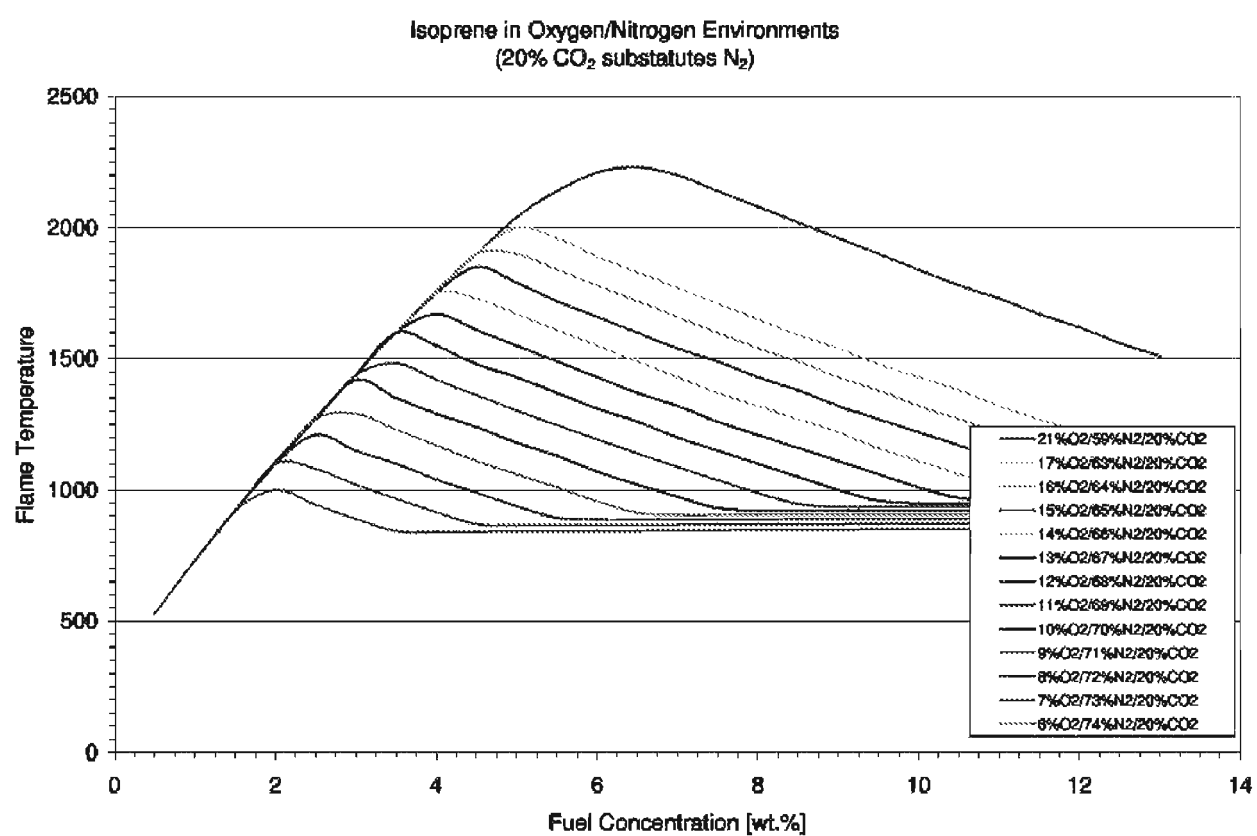


Figure 74

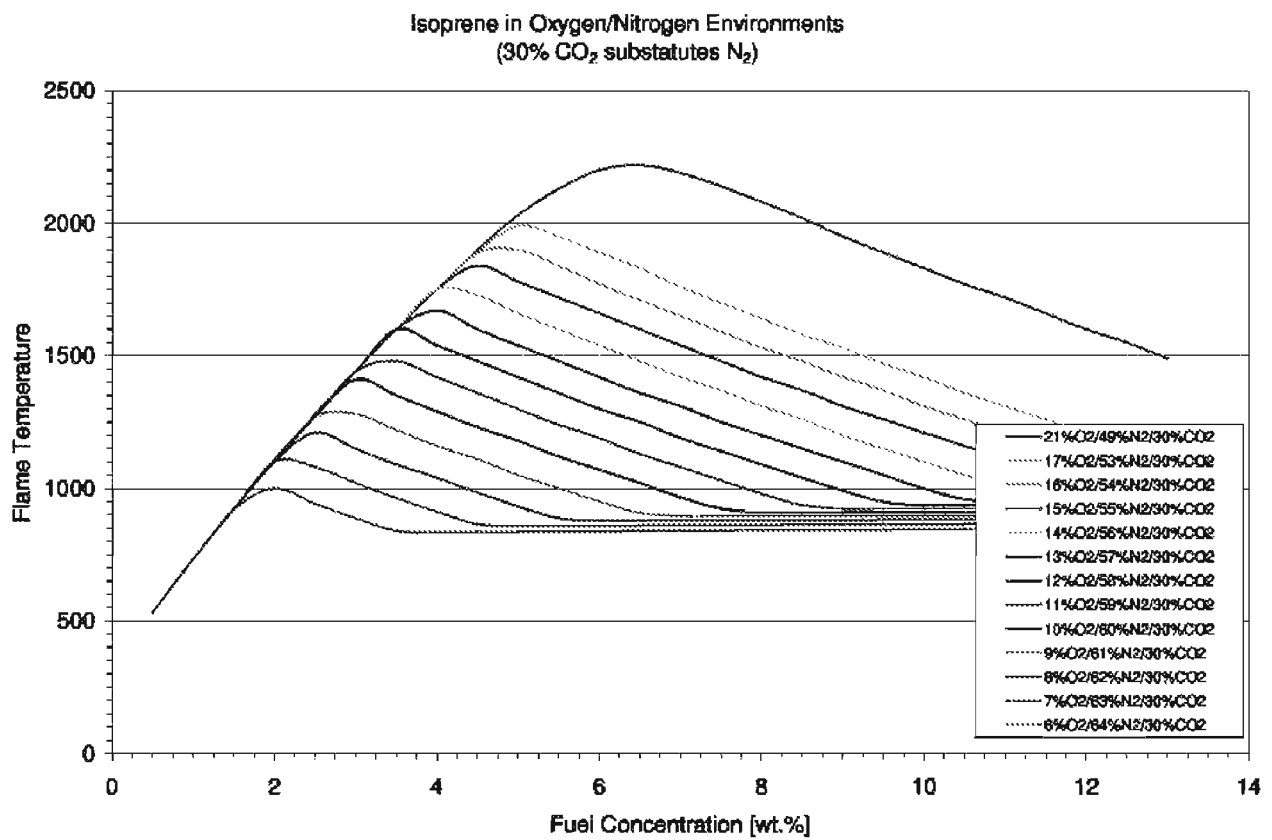


Figure 75A

Concentration at Deflagration													
Fuel Makeup				Oxidizer Makeup				Molar Concentration based on 100g of sample					
Fuel Makeup				Oxidizer Makeup				Molar Concentration based on 100g of sample					
Fuel Conc. (wt. %)	Isoprene (wt. %)	H ₂ O (wt. %)	O ₂ (wt. %)	N ₂ (wt. %)	Isoprene (mole)	H ₂ O (mole)	O ₂ (mole)	N ₂ (mole)	Total (mole)	Isoprene (vol. %)	O ₂ (vol. %)	N ₂ (vol. %)	H ₂ O (vol. %)
3.10	96.90	0	12	88	4.56	0.00	36.34	304.54	345.44	1.32	10.52	88.16	0.00
3.10	96.90	0	13	87	4.56	0.00	39.37	301.08	345.01	1.32	11.41	87.27	0.00
3.10	96.90	0	14	86	4.56	0.00	42.39	297.62	344.57	1.32	12.30	86.37	0.00
3.10	96.90	0	15	85	4.56	0.00	45.42	294.16	344.14	1.32	13.20	85.48	0.00
3.10	96.90	0	16	84	4.56	0.00	48.45	290.70	343.71	1.33	14.10	84.58	0.00
3.10	96.90	0	17	83	4.56	0.00	51.48	287.24	343.28	1.33	15.00	83.68	0.00
3.10	96.90	0	21	79	4.56	0.00	63.59	273.40	341.55	1.33	18.62	80.05	0.00
3.50	96.50	0	11.1	88.9	5.15	0.00	33.47	308.39	345.01	1.49	9.70	88.81	0.00
4.40	95.60	0	12	88	6.47	0.00	35.86	300.46	342.78	1.89	10.46	87.65	0.00
5.50	94.50	0	13	87	8.09	0.00	38.39	293.63	340.10	2.38	11.29	86.33	0.00
6.60	93.40	0	14	86	9.71	0.00	40.86	286.87	337.44	2.88	12.11	85.01	0.00
7.50	92.40	0	15	85	11.18	0.00	43.31	280.50	334.99	3.34	12.93	83.73	0.00
8.50	91.50	0	16	84	12.50	0.00	45.75	274.50	332.75	3.76	13.75	82.49	0.00
9.60	90.40	0	17	83	14.12	0.00	48.03	267.97	330.11	4.28	14.55	81.16	0.00
13.50	86.50	0	21	79	19.85	0.00	58.77	244.05	320.67	6.19	17.70	76.11	0.00

Figure 75B

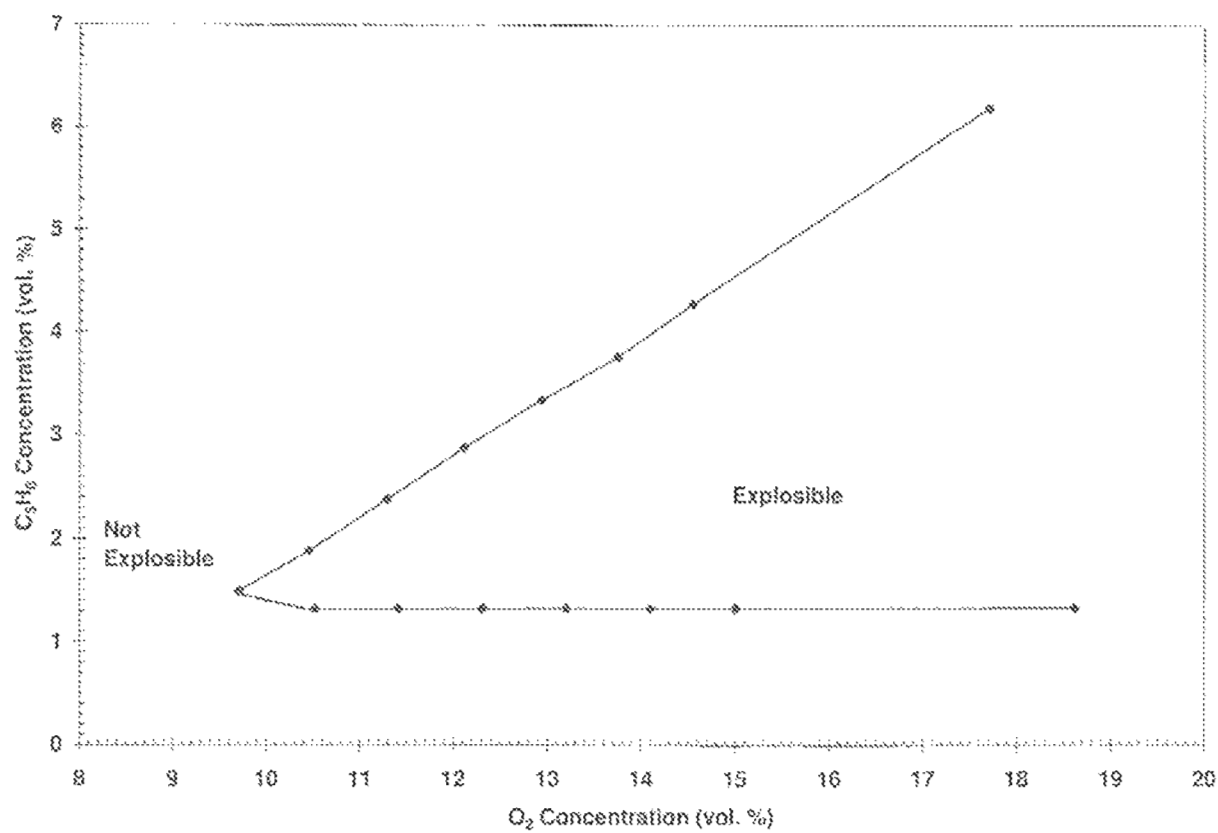


Figure 76A

Concentration at Deflagration															
		Fuel Makeup	Oxidizer Makeup				Molar Concentration based on 100g of sample					Volumetric Concentrations based on ideal gas law			
Fuel Conc. (wt %)	Oxidizer Conc. (wt %)	Isoprene (wt %)	H ₂ O (wt %)	O ₂ (wt %)	N ₂ (wt %)	Isoprene (mole)	H ₂ O (mole)	O ₂ (mole)	N ₂ (mole)	Total (mole)	Isoprene (vol %)	O ₂ (vol %)	N ₂ (vol %)	H ₂ O (vol %)	
3.252	96.748	100	4	12	84	4.78	21.50	36.28	290.24	352.81	1.35	10.28	82.27	6.09	
3.274	96.726	100	4	13	83	4.81	21.49	39.29	288.72	352.33	1.37	11.15	81.38	6.10	
3.290	96.710	100	4	14	82	4.84	21.49	42.31	283.22	351.86	1.38	12.02	80.49	6.11	
3.288	96.712	100	4	15	81	4.84	21.49	45.33	279.77	351.43	1.38	12.90	79.61	6.12	
3.286	96.714	100	4	16	80	4.83	21.49	48.36	276.30	351.01	1.36	13.78	78.72	6.12	
3.284	96.716	100	4	17	79	4.83	21.49	51.38	272.86	350.58	1.36	14.66	77.84	6.13	
3.276	96.724	100	4	21	75	4.82	21.49	63.48	259.09	343.67	1.36	18.19	74.26	6.16	
3.500	96.500	100	4	11.5	84.5	5.15	21.44	24.68	291.32	352.49	1.46	9.84	82.62	6.08	
4.200	95.800	100	4	12	84	6.18	21.29	35.93	287.40	350.79	1.76	10.24	81.93	6.07	
5.900	94.700	100	4	13	83	7.79	21.04	36.47	280.72	349.03	2.24	11.06	80.66	6.05	
6.400	93.600	100	4	14	82	9.41	20.80	40.95	274.11	345.28	2.73	11.86	79.39	6.02	
7.400	92.600	100	4	15	81	10.88	20.58	42.41	267.68	342.74	3.18	12.66	78.16	6.00	
8.500	91.500	100	4	16	80	12.50	20.33	45.75	261.43	340.01	3.68	13.48	76.89	5.98	
9.400	90.600	100	4	17	79	13.82	20.13	48.13	255.62	337.71	4.08	14.25	75.68	5.96	
13.300	86.700	100	4	21	75	19.56	19.27	56.90	232.23	327.95	5.96	17.25	70.61	5.87	

Figure 76B

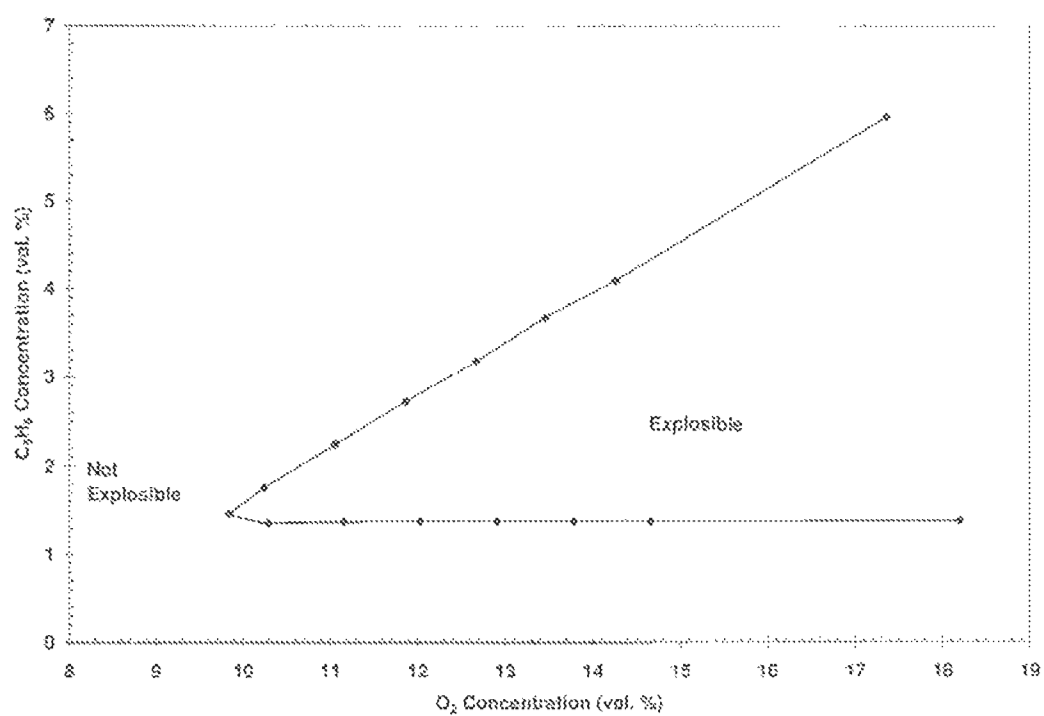


Figure 77

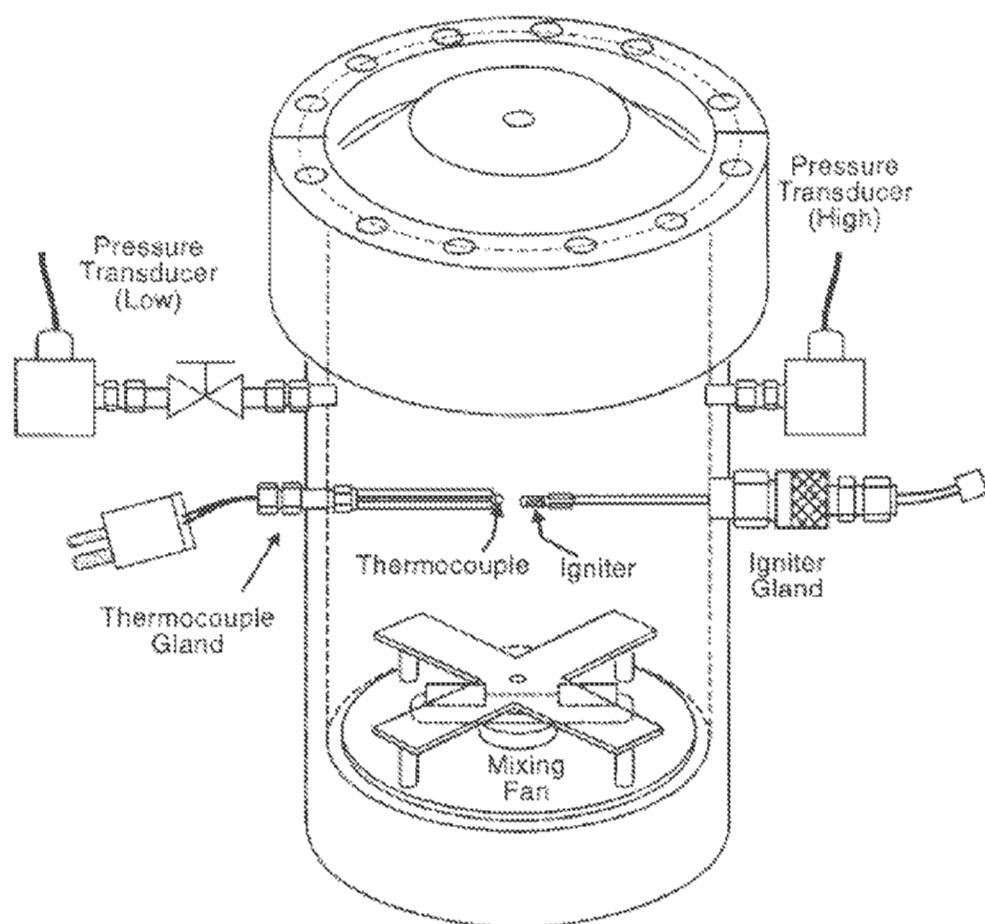
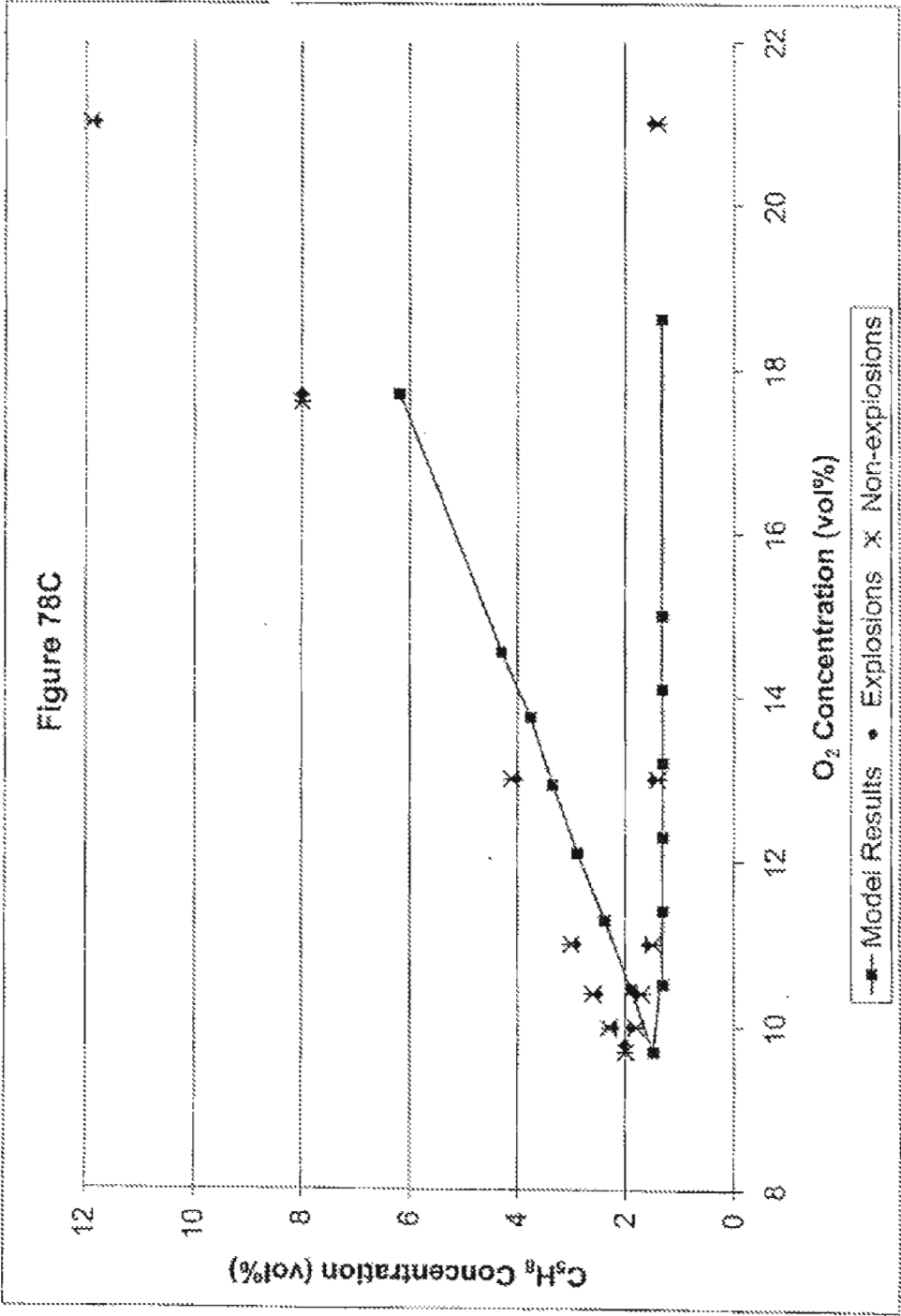


Figure 78B

Explosions		Non-explosions	
O ₂ Concentration	C ₅ H ₈ Concentration	O ₂ Concentration	C ₅ H ₈ Concentration
(vol. %)	(vol. %)	(vol. %)	(vol. %)
21.0	1.5	21.0	1.4
13.0	1.5	13.0	1.4
11.0	1.6	11.0	1.5
10.4	1.8	10.4	1.7
10.0	1.9	10.0	1.8
9.8	2	9.7	2
10.0	2.2	10.0	2.3
10.4	2.5	10.4	2.6
11.0	2.9	11.0	3.0
13.0	4.0	13.0	4.1
17.7	8.0	17.6	8.0
21.0	11.8	21.0	11.9



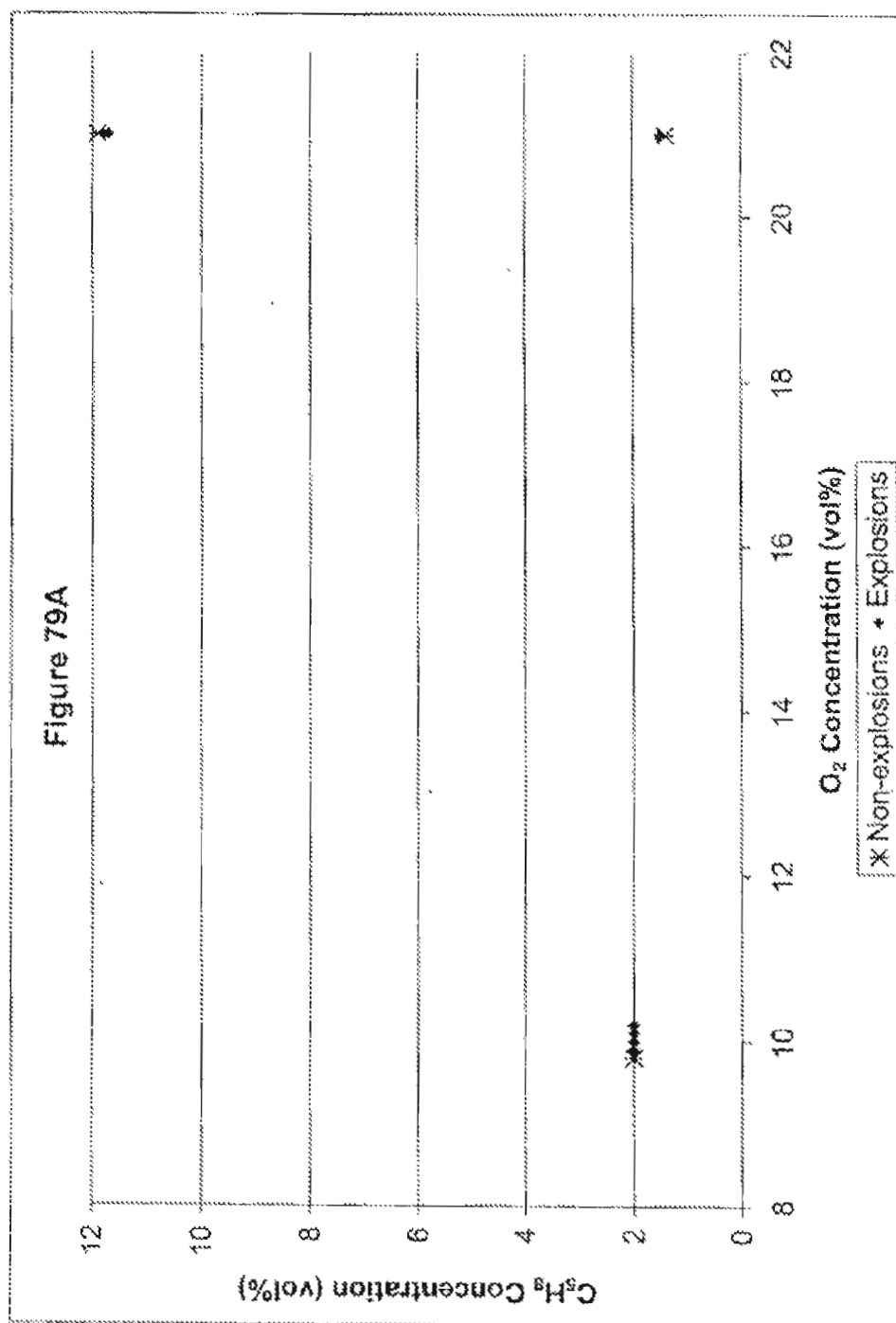


Figure 79B

Explosions		Non-explosions	
O ₂ Concentration	C ₅ H ₈ Concentration	O ₂ Concentration	C ₅ H ₈ Concentration
(vol. %)	(vol. %)	(vol. %)	(vol. %)
21.0	11.7	21.0	11.9
21.0	11.8	21.0	11.9
21.0	11.8	21.0	11.9
21.0	1.5	21.0	1.4
21.0	1.5	21.0	1.4
10.2	2.0	21.0	1.4
10.1	2.0	9.8	2.0
10.0	2.0	9.8	2.0
9.9	2.0	9.8	2.0

Figure 80A

TEST SERIES 1

Test	Data File Name	Temp °C	Initial Pressure bara	Partial Pressures			Concentrations			Result	Pex bara
				C ₂ H ₆ mbar	N ₂ mbar	O ₂ mbar	C ₂ H ₆ vol. %	N ₂ vol. %	O ₂ vol. %		
1	T11120700	40	1.012	12	787	213	1.2	77.8	21.0	Non-Explosion	1.05
2	T11120701	40	1.016	16	787	213	1.6	77.5	21.0	Explosion	5.5
3	T11120702	40	1.015	14	788	213	1.4	77.6	21.0	Non-Explosion	<1.02
4	T11120703	40	1.014	15	786	213	1.5	77.5	21.0	Non-Explosion	<1.02
5	T11120704	40	1.014	15	786	213	1.5	77.5	21.0	Explosion	4.31
6	T11120705	40	1.017	18	785	214	1.8	77.2	21.0	Explosion	5.47
7	T11120706	40	1.014	15	788	213	1.5	77.5	21.0	Explosion	4.51
8	T11120707	40	1.014	14	787	213	1.4	77.6	21.0	Non-Explosion	<1.02
9	T11120708	40	1.014	14	787	213	1.4	77.6	21.0	Non-Explosion	1.05
10	T11120709	40	1.015	102	700	213	10.0	69.0	21.0	Explosion	1.45
11	T11120710	40	1.014	102	699	213	10.1	68.9	21.0	Explosion	1.39
12	T11120711	40	1.014	106	695	213	10.5	68.5	21.0	Explosion	1.34
13	T11120712	40	1.014	113	688	213	11.1	67.9	21.0	Explosion	1.29
14	T11120713	40	1.014	122	679	213	12.0	67.0	21.0	Non-Explosion	<1.02
15	T11120714	40	1.014	117	684	213	11.5	67.5	21.0	Explosion	1.32
16	T11120715	40	1.014	120	681	213	11.8	67.2	21.0	Non-Explosion	1.08
17	T11130700	40	1.014	120	681	213	11.8	67.2	21.0	Explosion	1.09
18	T11130701	40	1.014	121	680	213	11.9	67.1	21.0	Non-Explosion	1.07
19	T11130702	40	1.015	121	681	213	11.9	67.1	21.0	Non-Explosion	1.06
20	T11130703	40	1.015	121	681	213	11.9	67.1	21.0	Non-Explosion	1.07
21	T11130704	40	1.015	30	853	132	3.0	84.0	13.0	Explosion	1.61
22	T11130705	40	1.014	36	846	132	3.6	83.4	13.0	Explosion	1.26
23	T11130706	40	1.014	39	843	132	3.8	83.1	13.0	Explosion	1.12
24	T11130707	40	1.015	41	842	132	4.0	83.0	13.0	Explosion	1.09
25	T11130708	40	1.014	42	840	132	4.1	82.8	13.0	Non-Explosion	1.06
26	T11130709	40	1.015	42	841	132	4.1	82.9	13.0	Non-Explosion	1.08
27	T11130710	40	1.014	42	840	132	4.1	82.8	13.0	Non-Explosion	1.05
28	T11130711	40	1.014	15	867	132	1.5	85.5	13.0	Non-Explosion	1.03
29	T11130712	40	1.014	16	866	132	1.6	85.4	13.0	Explosion	4.81
30	T11130713	40	1.014	15	867	132	1.5	85.5	13.0	Explosion	4
31	T11130714	40	1.014	14	868	132	1.4	85.6	13.0	Non-Explosion	1.03
32	T11130715	40	1.014	14	868	132	1.4	85.6	13.0	Non-Explosion	<1.02
33	T11130716	40	1.014	14	868	132	1.4	85.6	13.0	Non-Explosion	1.03
34	T11130717	40	1.015	20	868	112	2.0	87.0	11.0	Explosion	1.7
35	T11130718	40	1.014	28	874	112	2.8	86.2	11.0	Non-Explosion	1.09
36	T11130719	40	1.014	28	874	112	2.8	86.2	11.0	Non-Explosion	1.08
37	T11130720	40	1.014	28	874	112	2.8	86.2	11.0	Explosion	1.13
38	T11130721	40	1.015	29	874	112	2.9	86.1	11.0	Non-Explosion	1.08
39	T11130722	40	1.014	29	873	112	2.9	86.1	11.0	Explosion	1.1

Figure 80B

Test	Data File Name	Temp °C	Initial Pressure bara	Partial Pressures			Concentrations			Result	Pex bara
				C ₂ H ₂ mbar	N ₂ mbar	O ₂ mbar	C ₂ H ₂ vol. %	N ₂ vol. %	O ₂ vol. %		
40	T11130723	40	1.014	30	872	112	3.0	86.0	11.0	Non-Explosion	1.08
41	T11130724	40	1.014	30	872	112	2.0	86.0	11.0	Non-Explosion	1.05
42	T11130725	40	1.014	30	872	112	3.0	86.0	11.0	Non-Explosion	1.05
43	T11130726	40	1.014	15	887	112	1.5	87.5	11.0	Non-Explosion	<1.02
44	T11130727	40	1.014	15	887	112	1.5	87.5	11.0	Non-Explosion	<1.02
45	T11140700	40	1.014	16	886	112	1.6	87.4	11.0	Non-Explosion	<1.02
46	T11140701	40	1.014	17	886	112	1.7	87.3	11.0	Explosion	1.81
47	T11140702	40	1.014	16	886	112	1.6	87.4	11.0	Explosion	1.54
48	T11140703	40	1.014	16	887	112	1.5	87.5	11.0	Non-Explosion	<1.02
49	T11140704	40	1.015	20	899	96	2.0	88.6	9.5	Non-Explosion	1.05
50	T11140705	40	1.014	20	898	96	2.0	88.6	9.5	Non-Explosion	1.05
51	T11140706	40	1.014	23	890	101	2.3	87.8	10.0	Non-Explosion	1.05
52	T11140707	40	1.015	23	886	106	2.3	87.3	10.4	Explosion	1.19
53	T11140708	40	1.014	25	884	105	2.5	87.2	10.4	Explosion	1.09
54	T11140709	40	1.014	26	883	105	2.6	87.1	10.4	Non-Explosion	1.05
55	T11140710	40	1.014	26	883	105	2.6	87.1	10.4	Non-Explosion	1.06
56	T11140711	40	1.014	26	883	105	2.6	87.1	10.4	Non-Explosion	1.07
57	T11140712	40	1.014	20	889	105	2.0	87.7	10.4	Explosion	1.21
58	T11140713	40	1.014	17	892	105	1.7	88.0	10.4	Non-Explosion	1.04
59	T11140714	40	1.014	18	891	105	1.8	87.9	10.4	Explosion	1.21
60	T11140715	40	1.014	17	892	105	1.7	88.0	10.4	Non-Explosion	1.03
61	T11140716	40	1.014	17	892	105	1.7	88.0	10.4	Non-Explosion	1.03
62	T11140717	40	1.014	21	890	103	2.1	87.8	10.2	Explosion	1.1
63	T11140718	40	1.014	21	891	102	2.1	87.9	10.1	Explosion	1.09
64	T11140719	40	1.014	21	892	101	2.1	88.0	10.0	Explosion	1.09
65	T11140720	40	1.014	22	891	101	2.2	87.9	10.0	Explosion	1.1
66	T11140721	40	1.014	23	890	101	2.3	87.8	10.0	Non-Explosion	1.06
67	T11140722	40	1.014	23	890	101	2.3	87.8	10.0	Non-Explosion	1.08
68	T11140723	40	1.014	19	894	101	1.9	88.2	10.0	Explosion	1.12
69	T11140724	40	1.014	18	895	101	1.8	88.3	10.0	Non-Explosion	1.06
70	T11140725	40	1.014	18	895	101	1.8	88.3	10.0	Non-Explosion	1.03
71	T11140726	40	1.014	18	895	101	1.8	88.3	10.0	Non-Explosion	1.04
72	T11140727	40	1.014	20	895	99	2.0	88.3	9.8	Non-Explosion	1.08
73	T11140728	40	1.014	20	895	99	2.0	88.3	9.8	Explosion	1.1
74	T11140729	40	1.014	20	896	98	2.0	88.4	9.7	Non-Explosion	1.05
75	T11140730	40	1.014	20	896	98	2.0	88.4	9.7	Non-Explosion	1.08
76	T11140731	40	1.014	20	896	98	2.0	88.4	9.7	Non-Explosion	1.07
77	T11140732	40	1.014	81	761	172	8.0	75.0	17.0	Non-Explosion	1.04
78	T11140733	40	1.014	81	750	183	8.0	74.0	18.0	Explosion	1.2
79	T11140734	40	1.014	81	754	179	8.0	74.4	17.7	Explosion	1.24
80	T11140735	40	1.014	81	757	178	8.0	74.7	17.4	Non-Explosion	1.03
81	T11140736	40	1.014	81	755	178	8.0	74.5	17.6	Non-Explosion	1.05
82	T11140737	40	1.014	81	755	178	8.0	74.5	17.6	Non-Explosion	1.03
83	T11140738	40	1.014	81	755	178	8.0	74.5	17.6	Non-Explosion	1.03

Figure 81

TEST SERIES 2

Test	Data File Name	Temp °C	Initial Pressure bara	Partial Pressures				Concentrations				Result	Pex bara
				H ₂ O mbar	C ₂ H ₆ mbar	N ₂ mbar	O ₂ mbar	H ₂ O vol. %	C ₂ H ₆ vol. %	N ₂ vol. %	O ₂ vol. %		
1	T11160700	40	1.014	41	119	841	213	4.0	11.7	83.2	21.0	Explosion	1.23
2	T11160701	40	1.014	40	121	840	213	3.9	11.9	83.1	21.0	Non-explosion	1.07
3	T11160702	40	1.014	41	120	840	213	4.0	11.8	83.1	21.0	Explosion	1.09
4	T11160703	40	1.014	40	121	840	213	3.9	11.9	83.1	21.0	Non-explosion	1.05
5	T11160704	40	1.014	40	120	841	213	3.9	11.8	83.2	21.0	Explosion	1.09
6	T11160705	40	1.014	40	121	840	213	3.9	11.9	83.1	21.0	Non-explosion	1.08
7	T11160706	40	1.014	40	15	746	213	3.9	1.5	73.6	21.0	Explosion	4.68
8	T11160707	40	1.014	41	15	745	213	4.0	1.5	73.5	21.0	Explosion	5.27
9	T11160708	40	1.014	41	14	746	213	4.0	1.4	73.6	21.0	Non-explosion	1.03
10	T11160709	40	1.014	42	14	745	213	4.1	1.4	73.5	21.0	Non-explosion	1.03
11	T11160700	40	1.014	41	14	746	213	4.0	1.4	73.6	21.0	Non-explosion	1.03
12	T11160701	40	1.014	41	20	850	103	4.0	2.0	83.8	10.2	Explosion	1.11
13	T11160702	40	1.014	41	20	851	102	4.0	2.0	83.9	10.1	Explosion	1.11
14	T11160703	40	1.014	41	20	852	101	4.0	2.0	84.0	10.0	Explosion	1.09
15	T11160704	40	1.014	41	20	853	100	4.0	2.0	84.1	9.9	Explosion	1.09
16	T11160705	40	1.014	41	20	854	99	4.0	2.0	84.2	9.8	Non-explosion	1.07
17	T11160706	40	1.014	40	20	855	99	3.9	2.0	84.3	9.8	Non-explosion	1.06
18	T11160707	40	1.014	41	20	854	98	4.0	2.0	84.2	9.8	Non-explosion	1.08

Figure 82

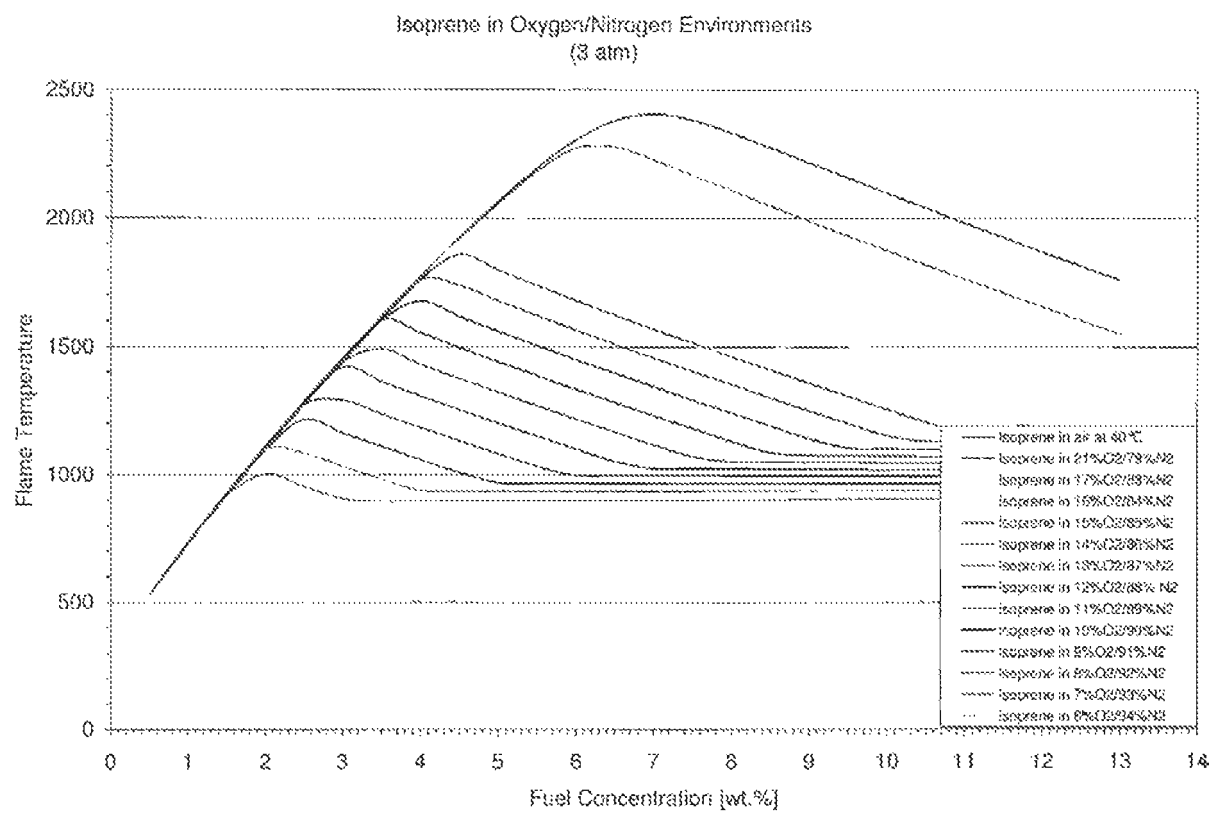


Figure 83

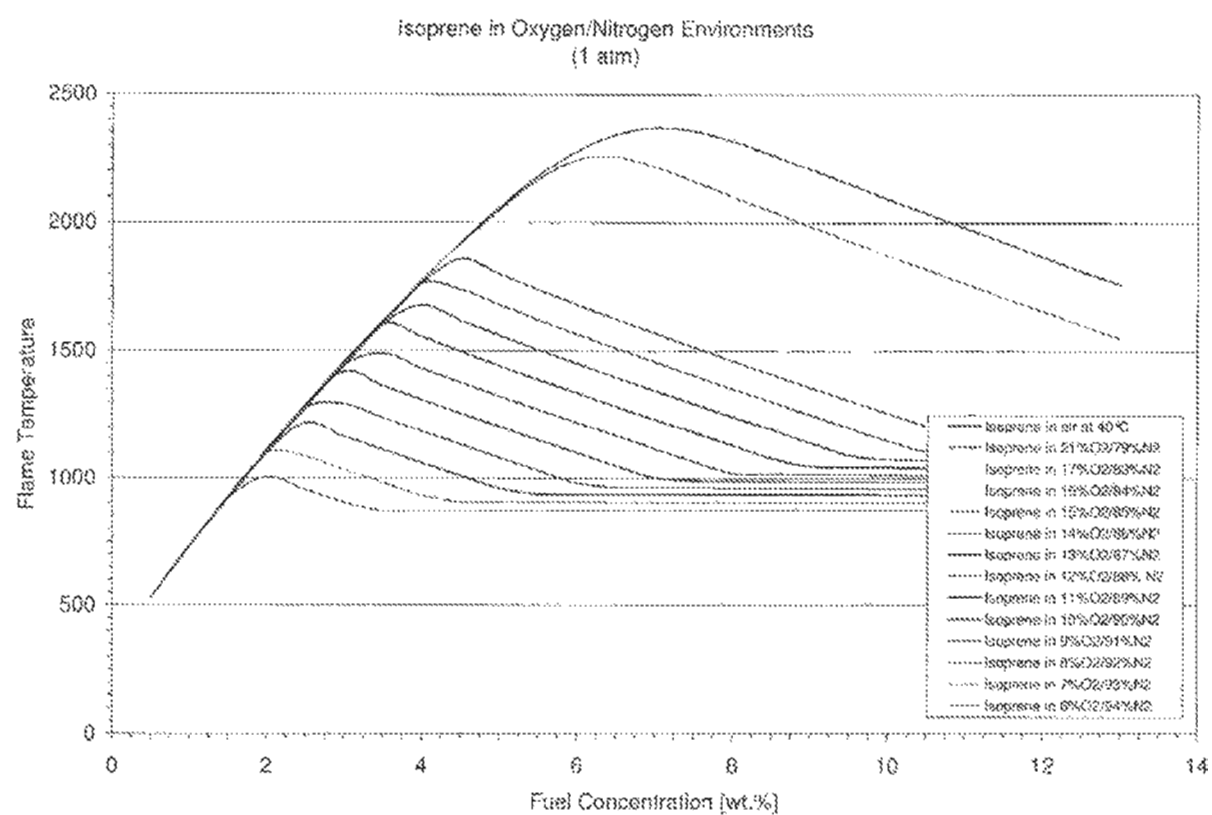


Figure 84

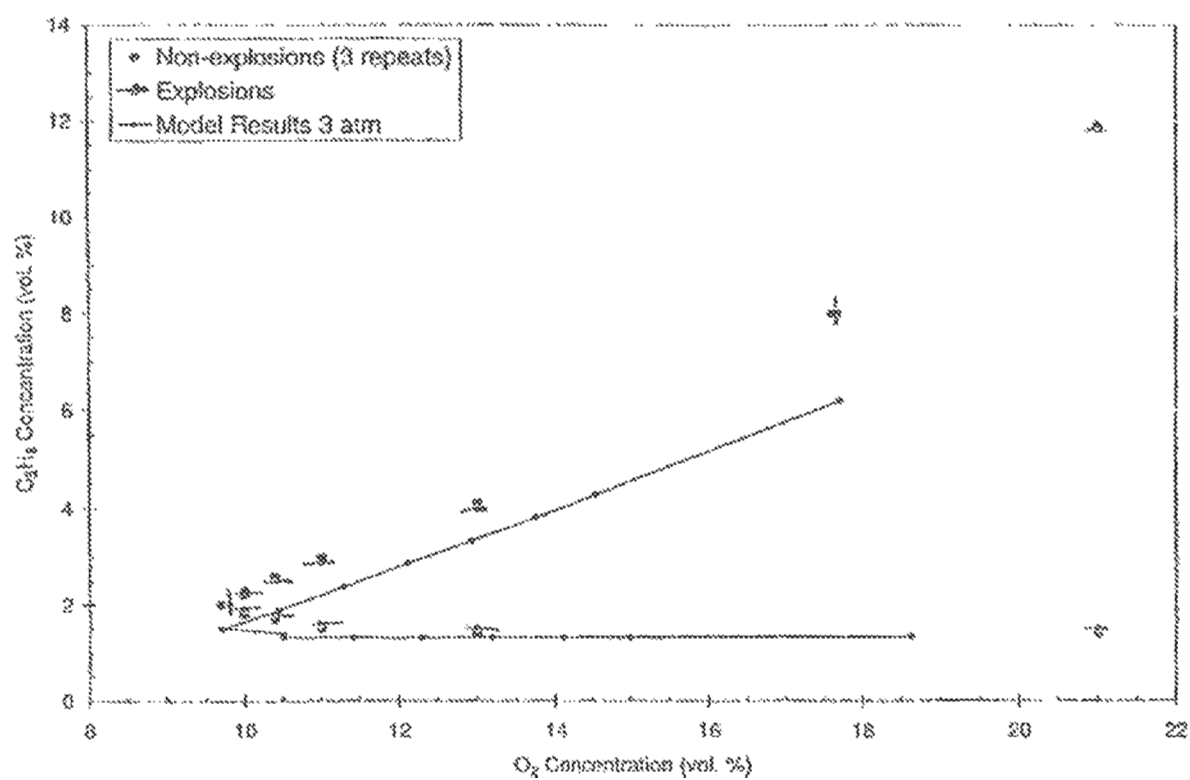


Figure 85

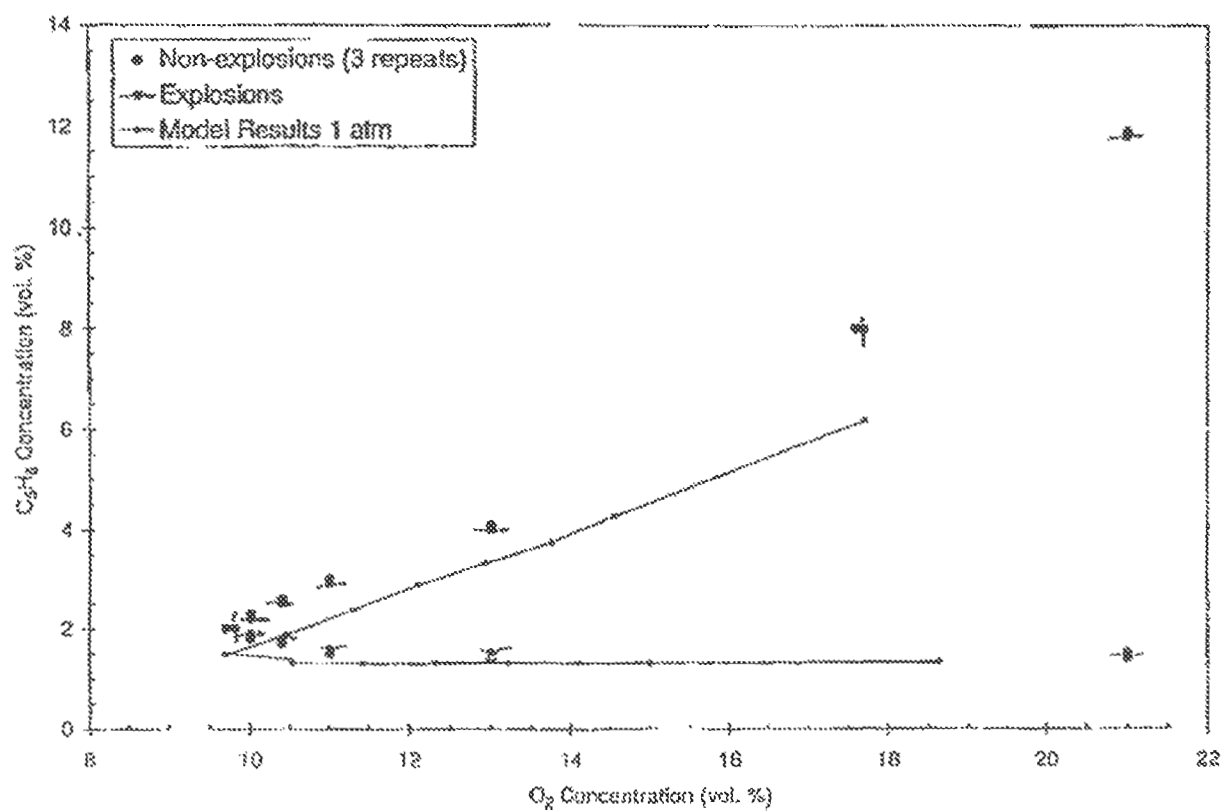


Figure 86A

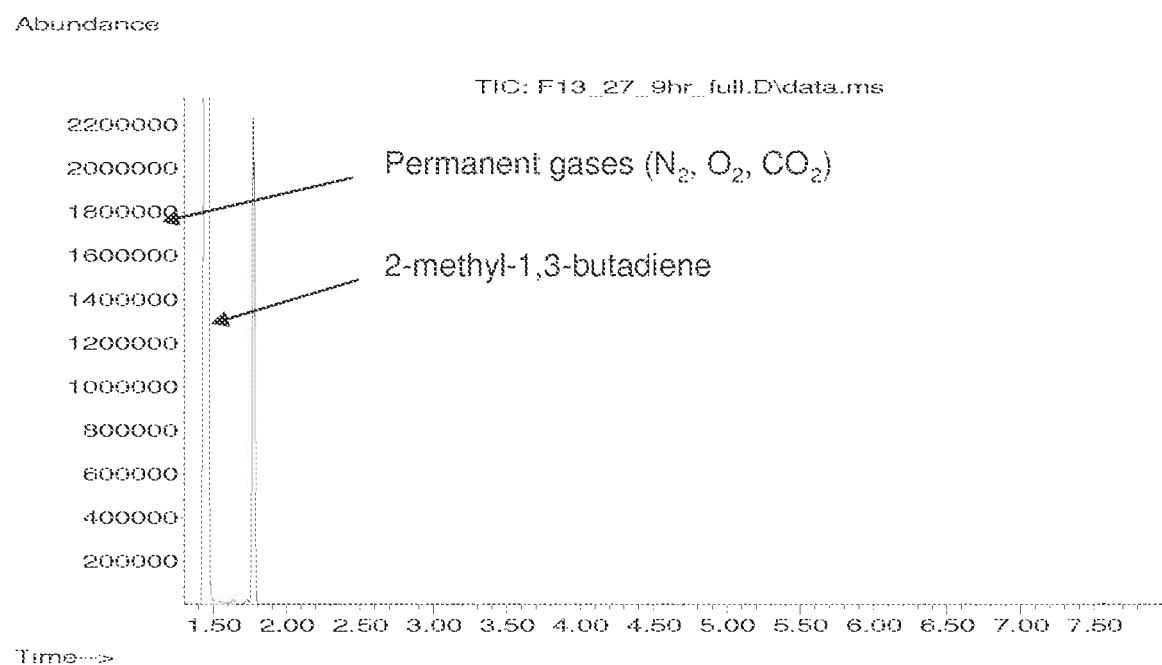
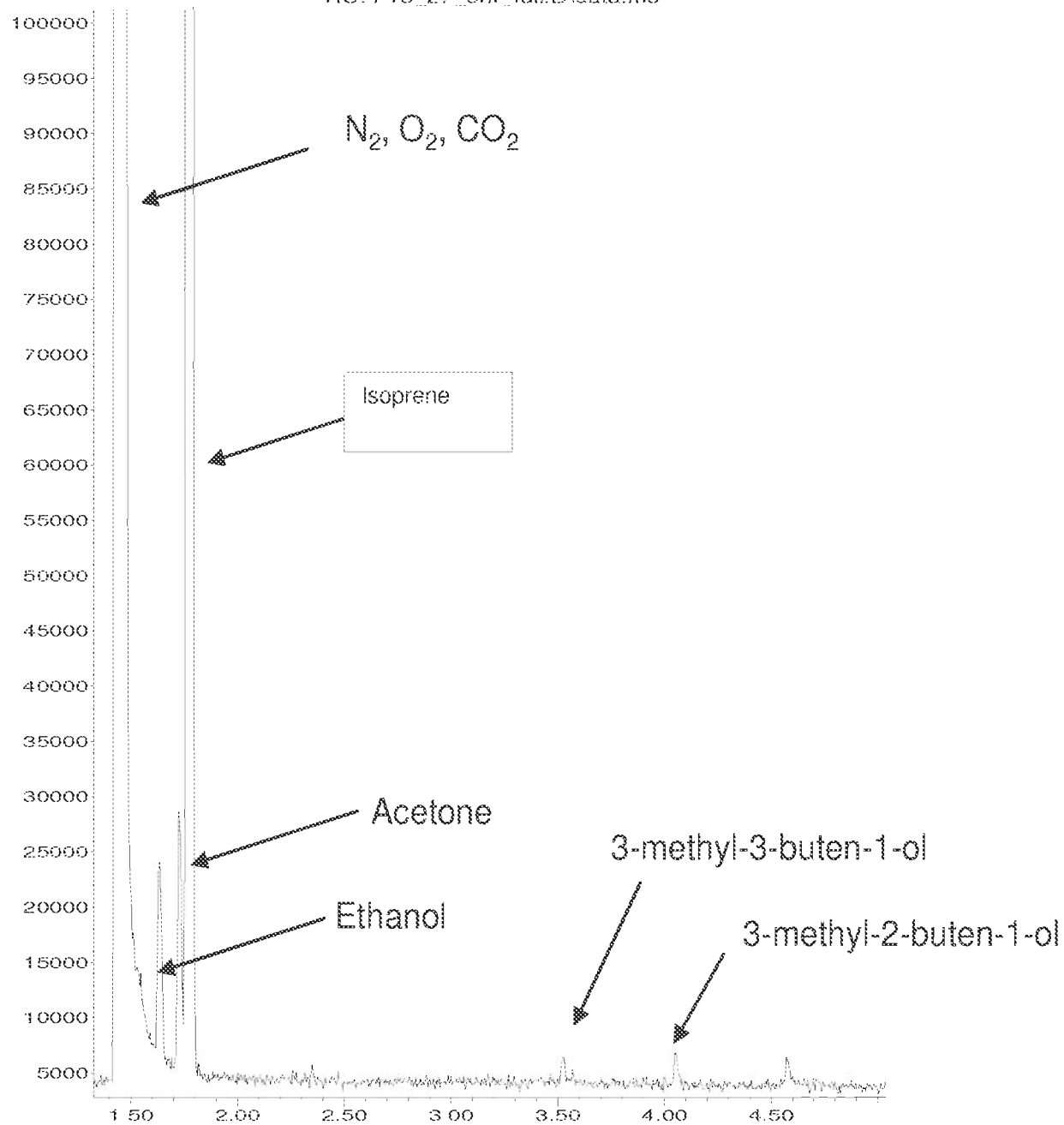


Figure 86B

Abundance

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Time-->

Figure 87A

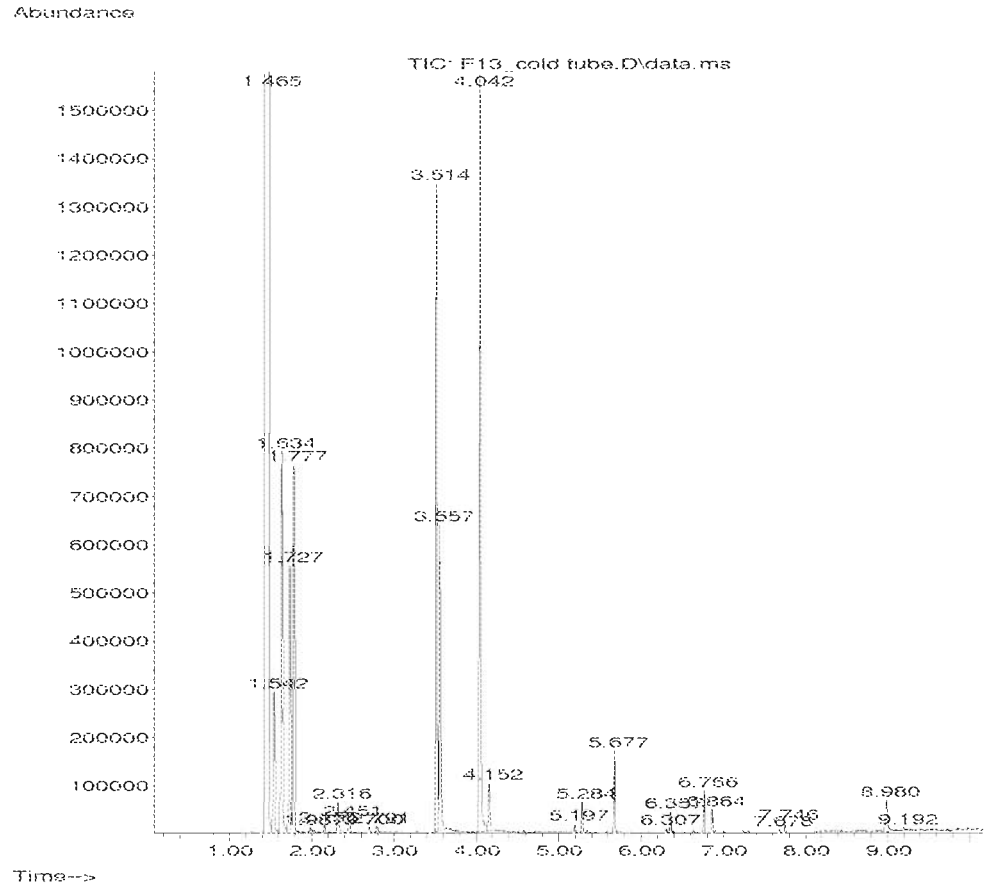


Figure 87B

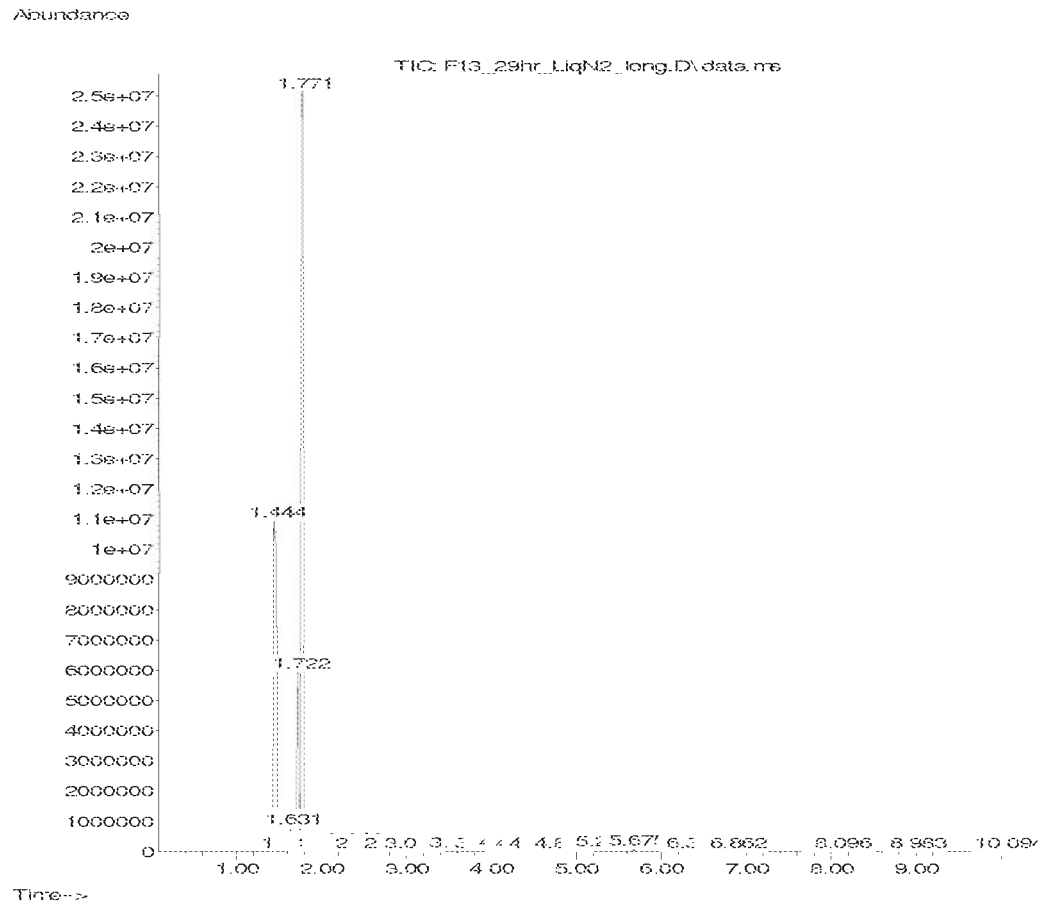


Figure 87C

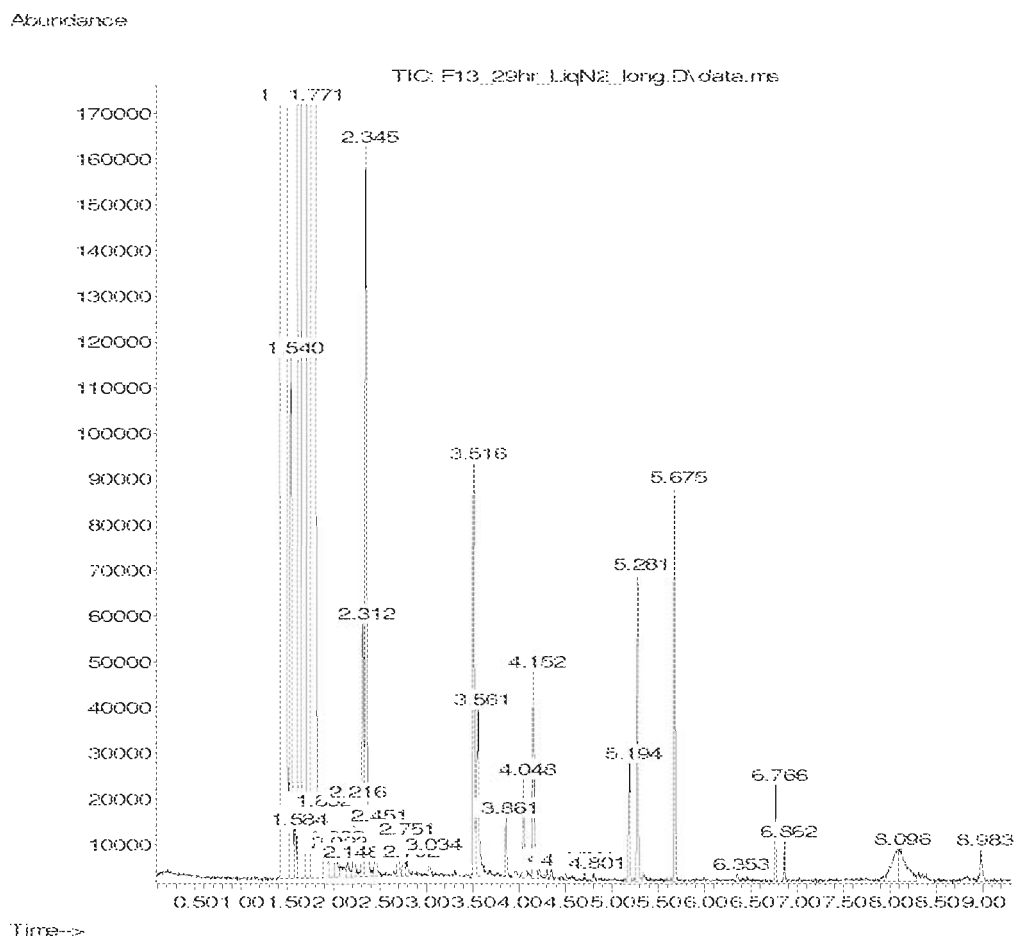


Figure 87D

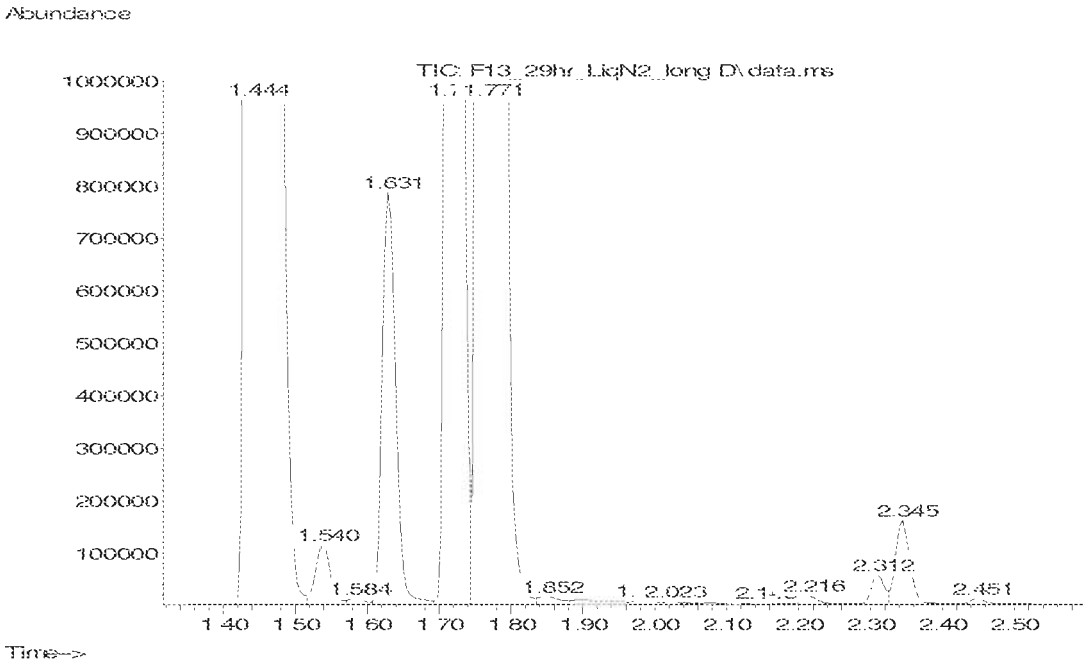
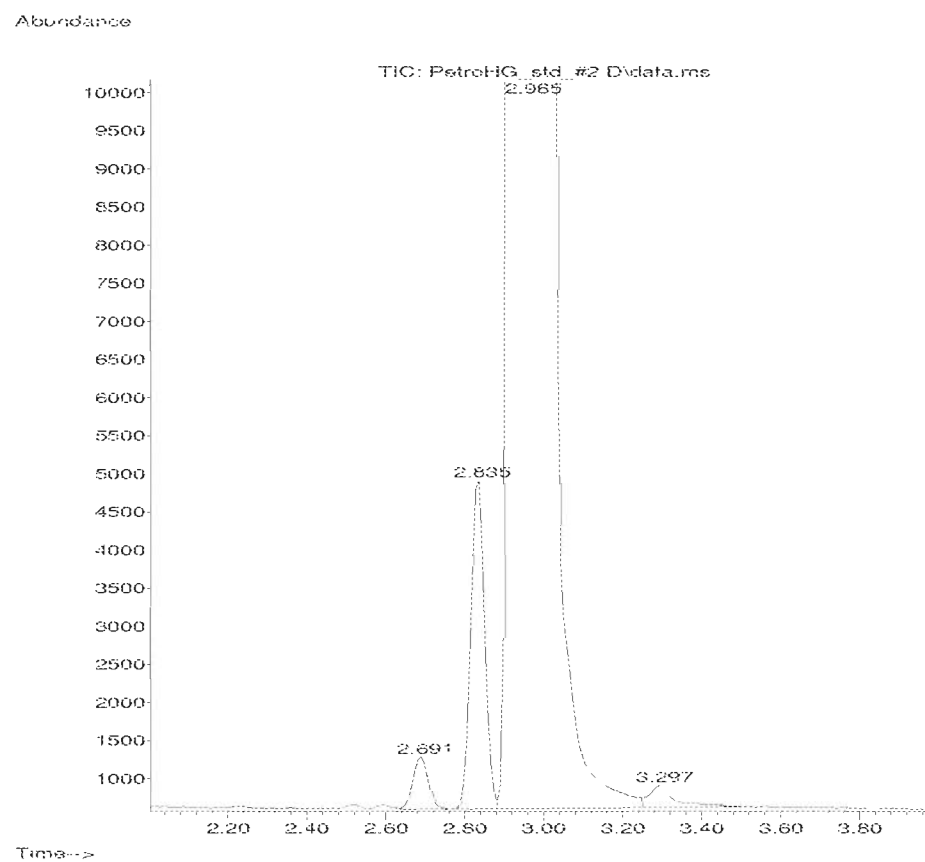
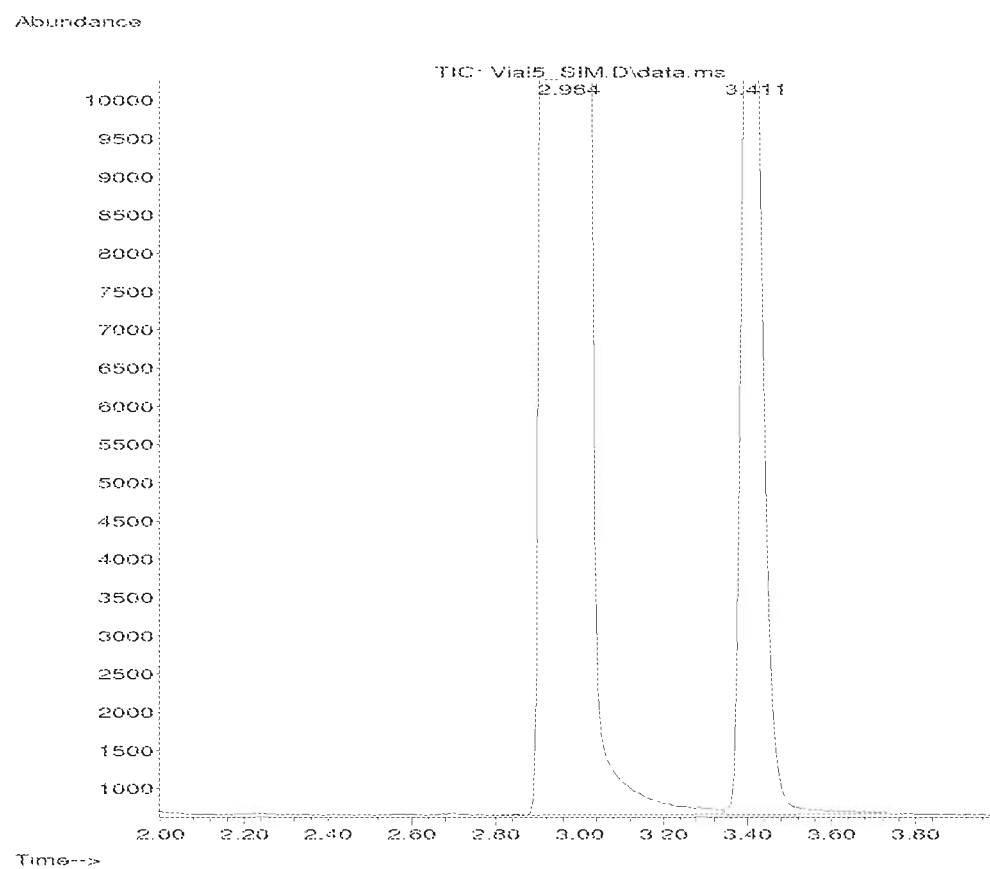


Figure 88A



2-methyl-1,3-butadiene standard.

Figure 88B



2-methyl-1,3-butadiene from recombinant *E. coli*

Figure 89

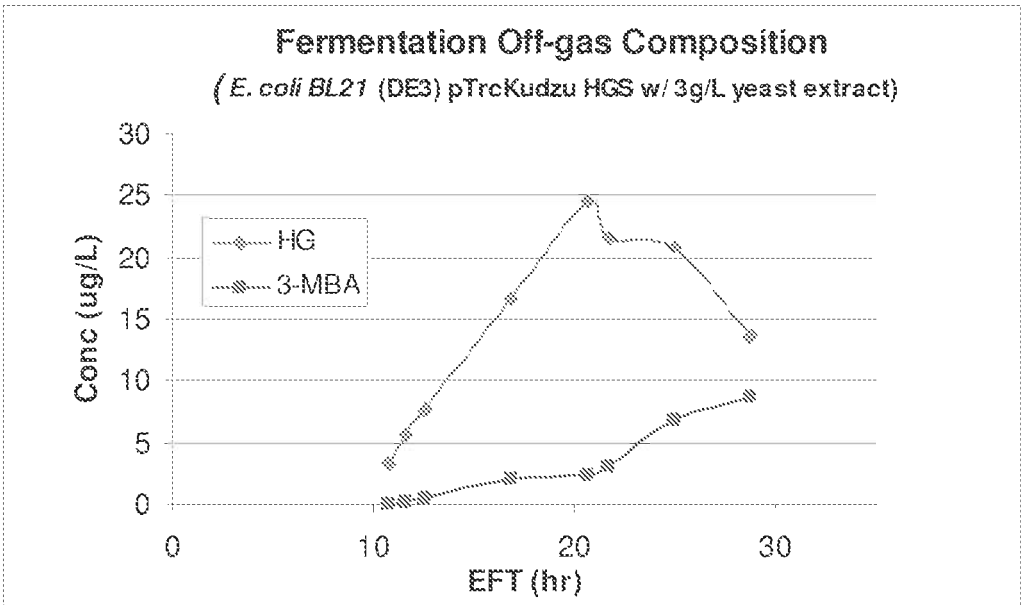
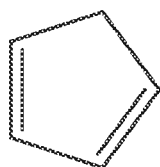
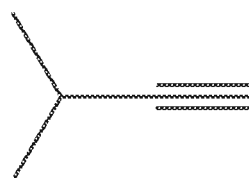


Figure 90



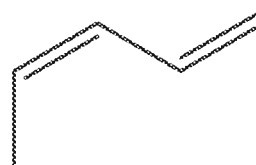
cyclopentadiene



"isopryne" = 3-Me-1-butyne



trans-piperylene



cis-piperylene



1-pentyne



pent-4-ene-1-yne



trans-pent-3-ene-1-yne



cis-pent-3-ene-1-yne

Figure 91

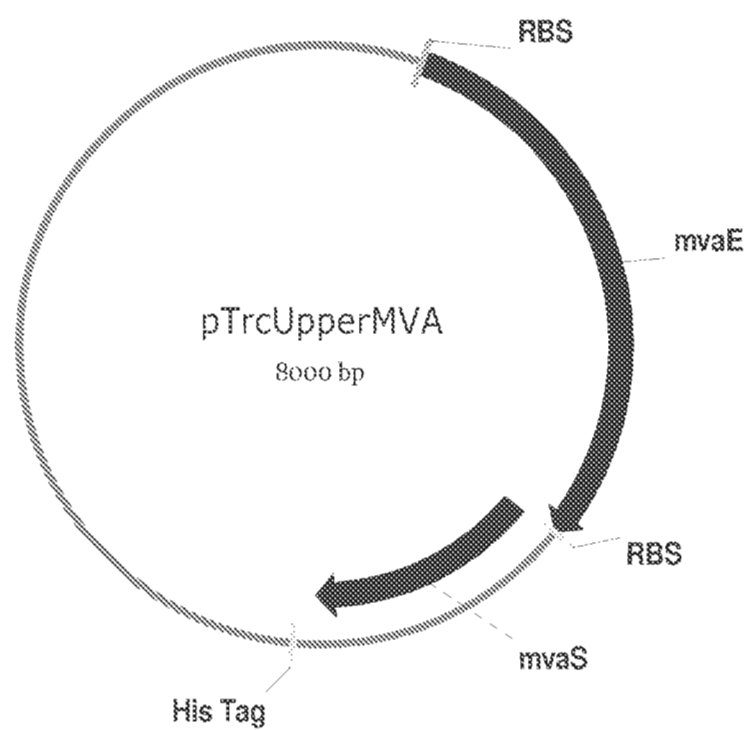


Figure 92A

1-

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Figure 92B

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Figure 92C

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Figure 93

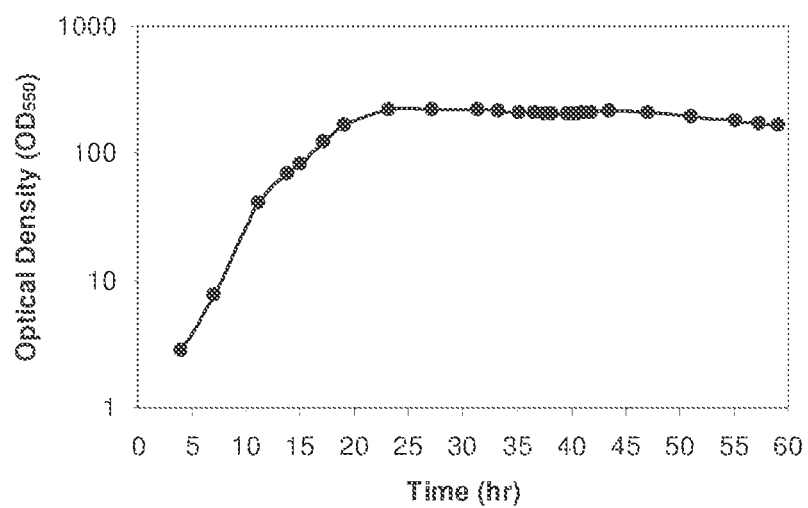


Figure 94

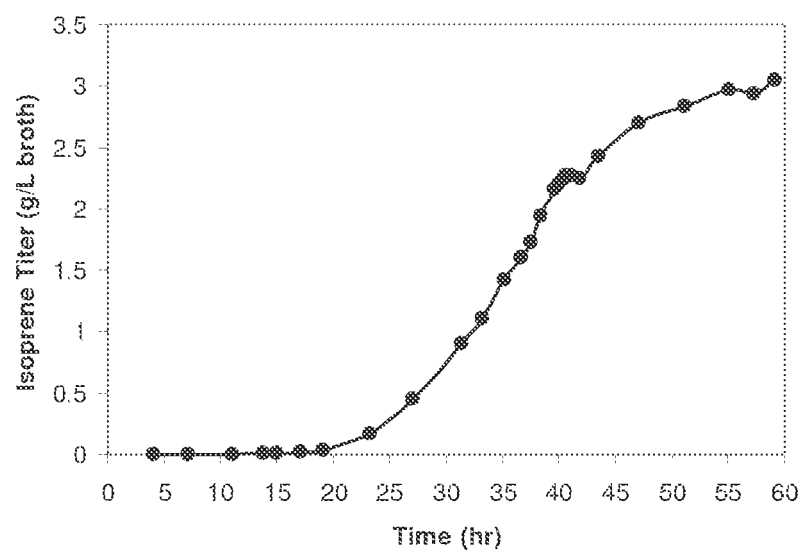


Figure 95

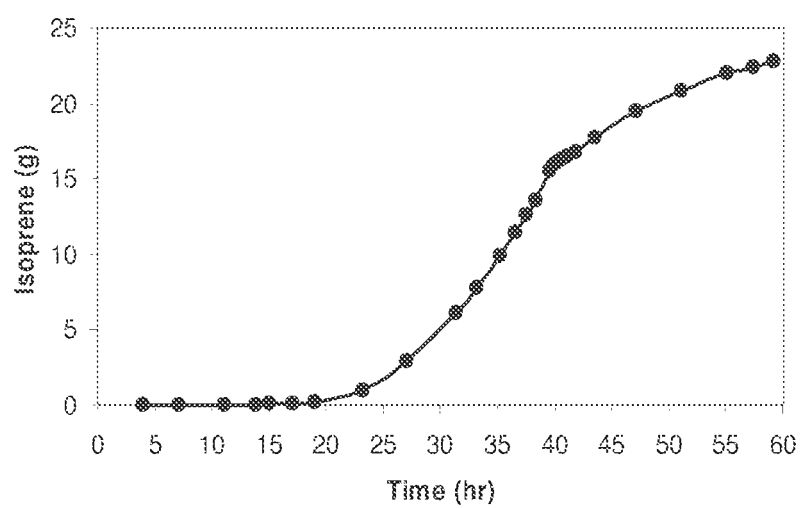


Figure 96

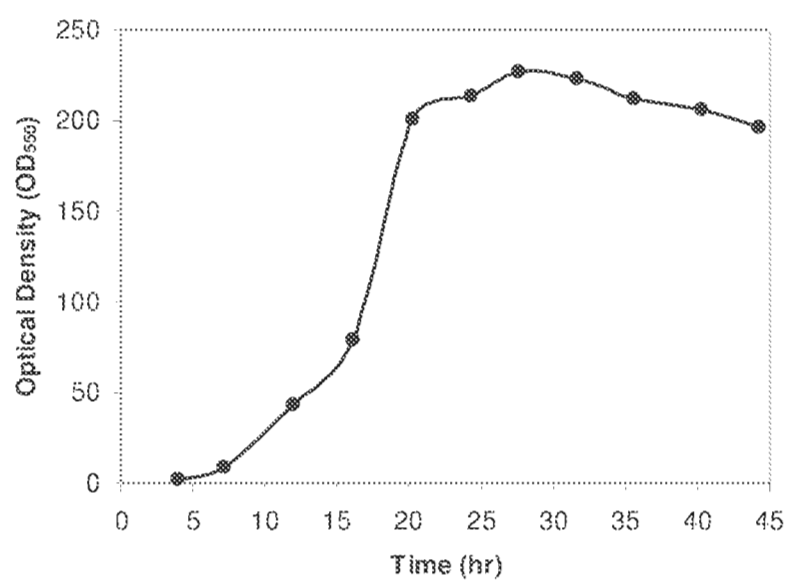


Figure 97

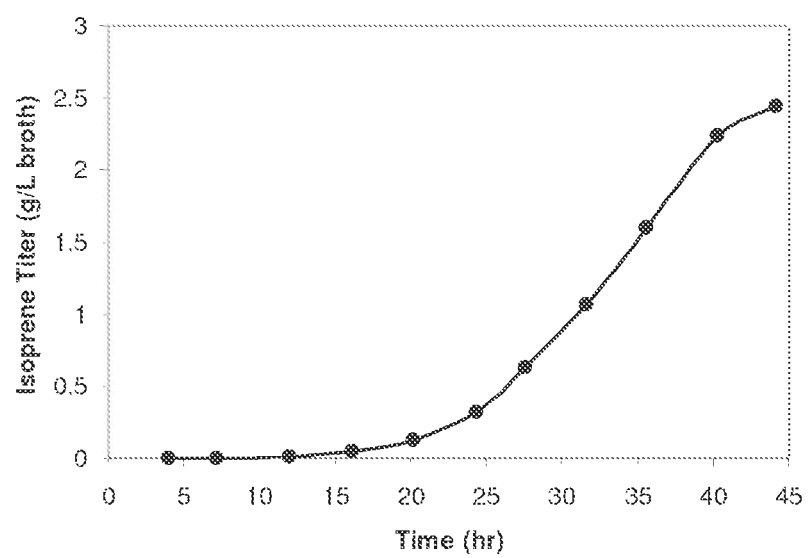


Figure 98

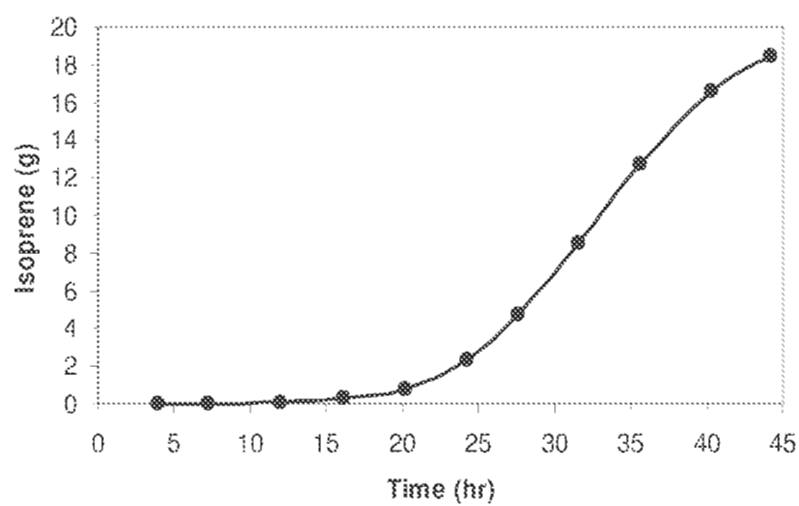


Figure 99

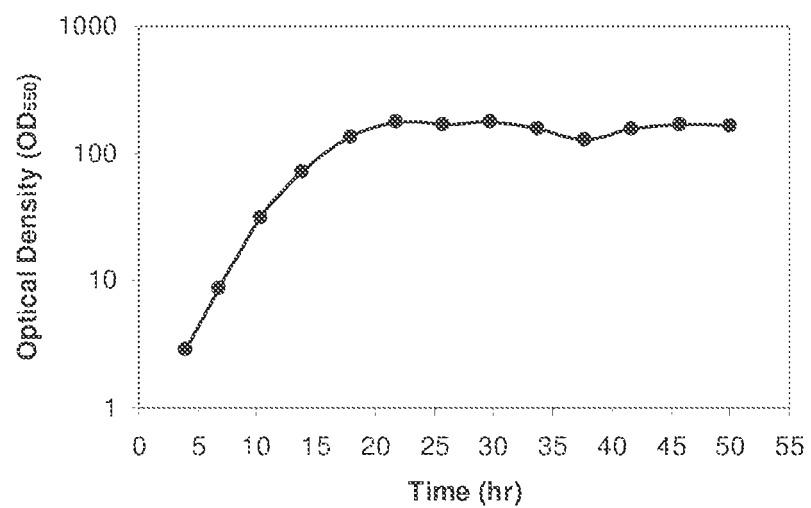


Figure 100

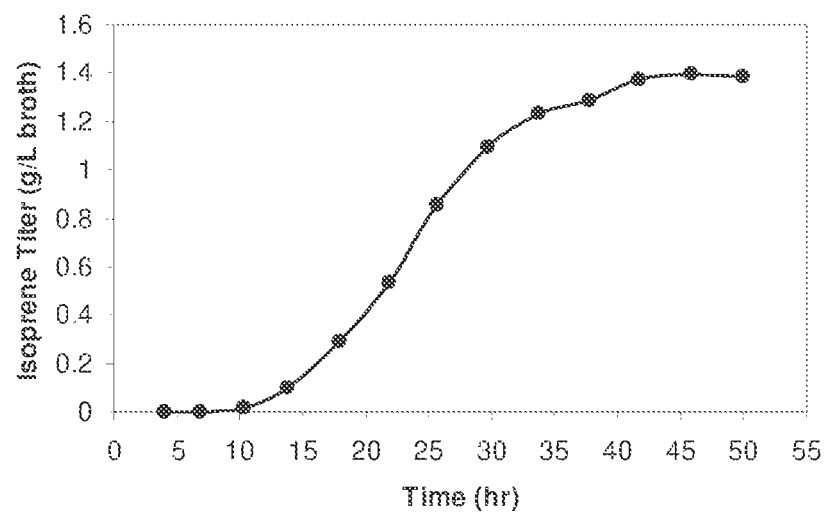


Figure 101

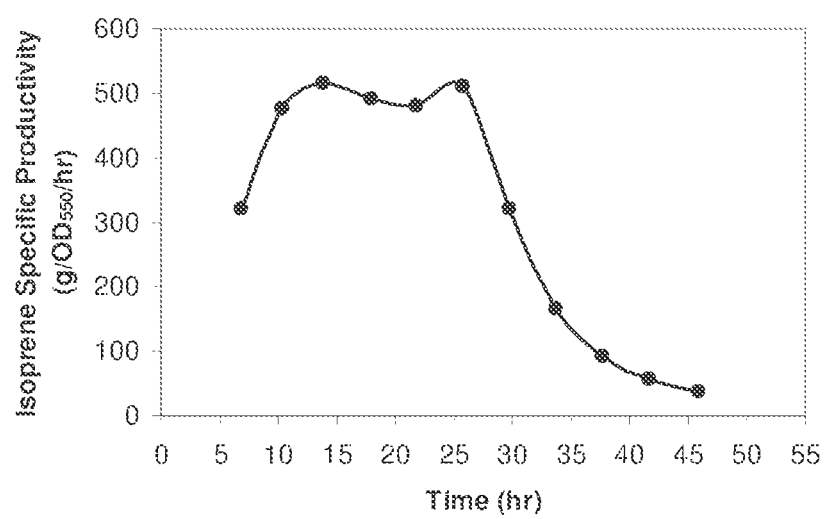
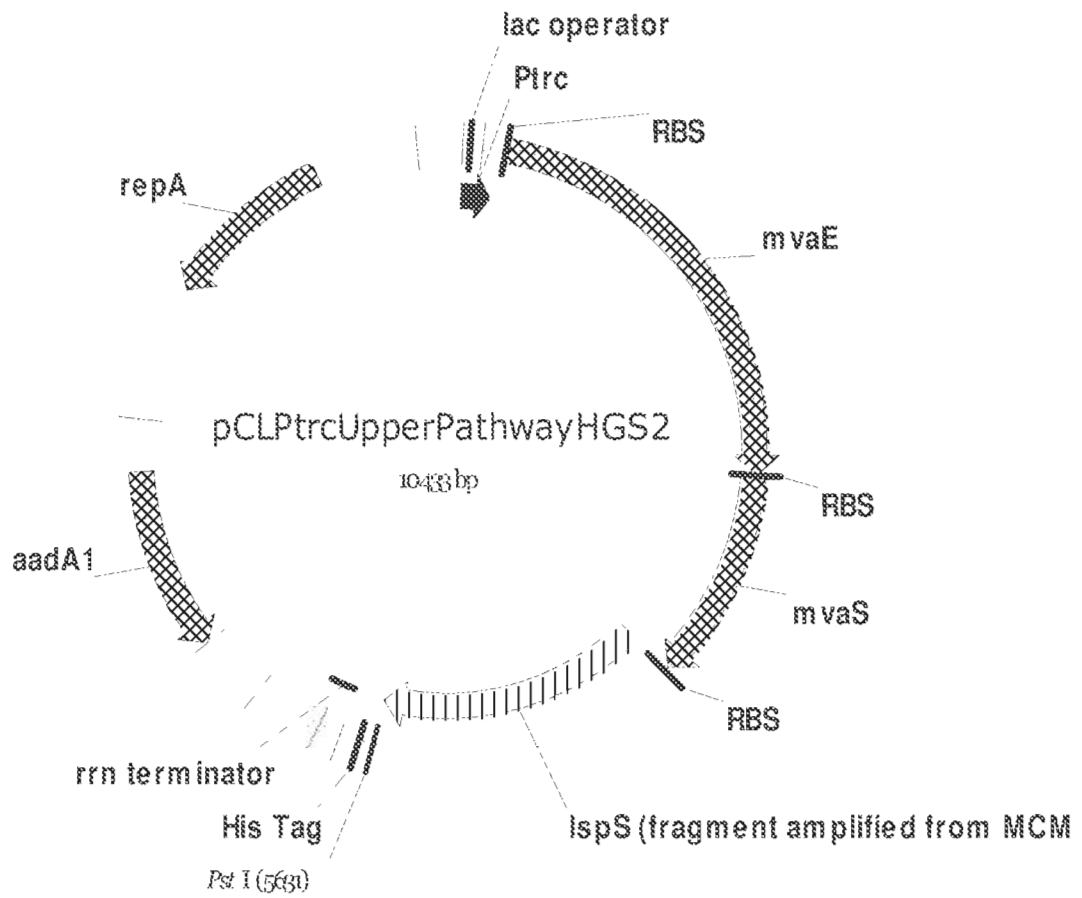


Figure 102



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Figure 103C

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Figure 104

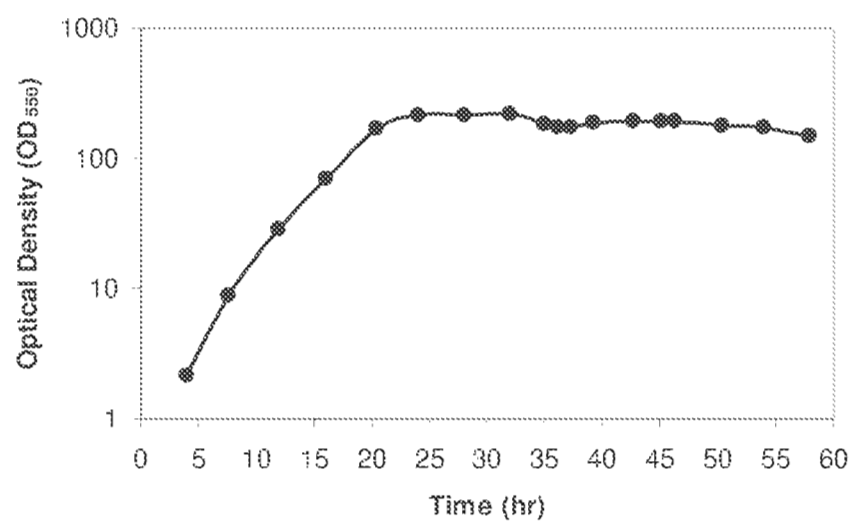


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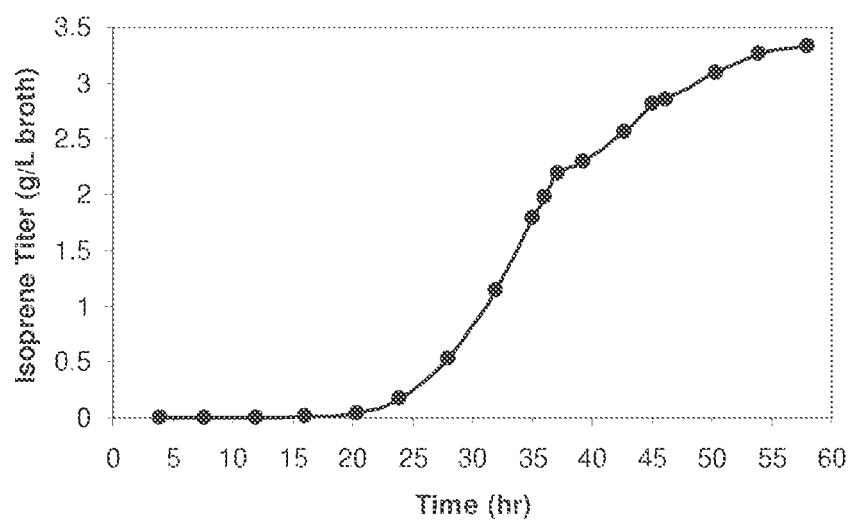


Figure 106

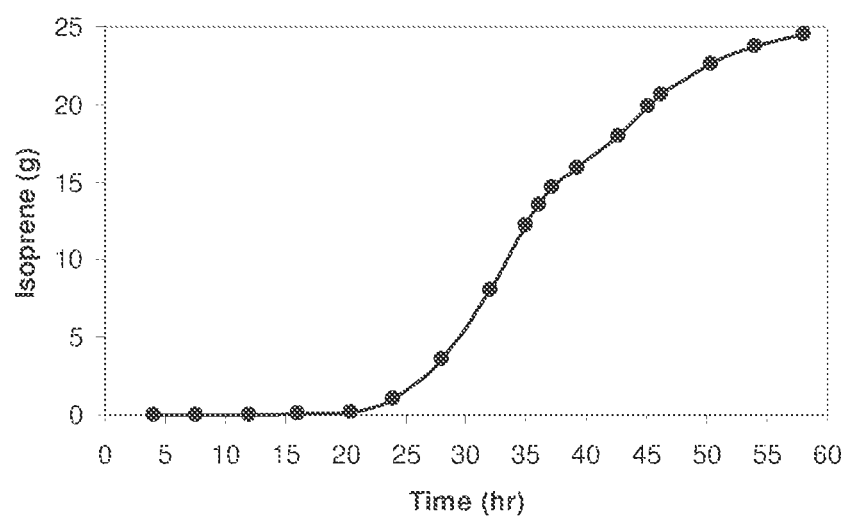


Figure 107

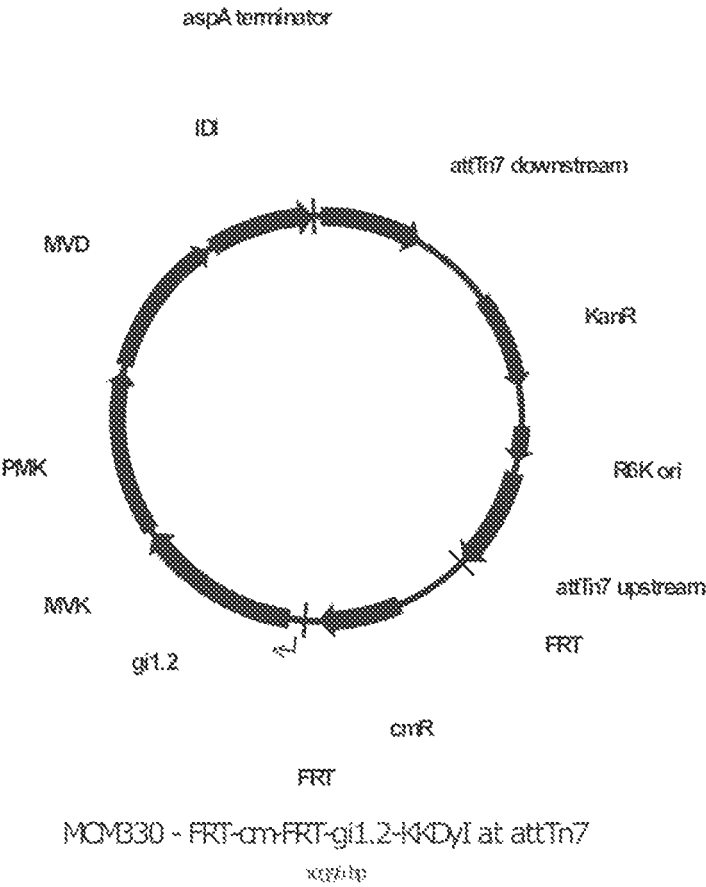


Figure 108A

1-

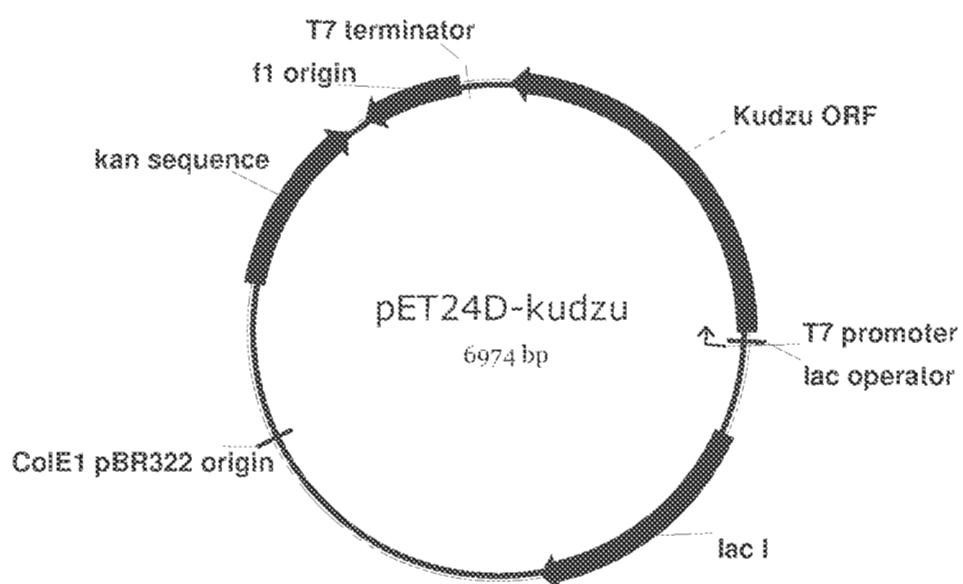
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Figure 108B

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Figure 109



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Figure 111A

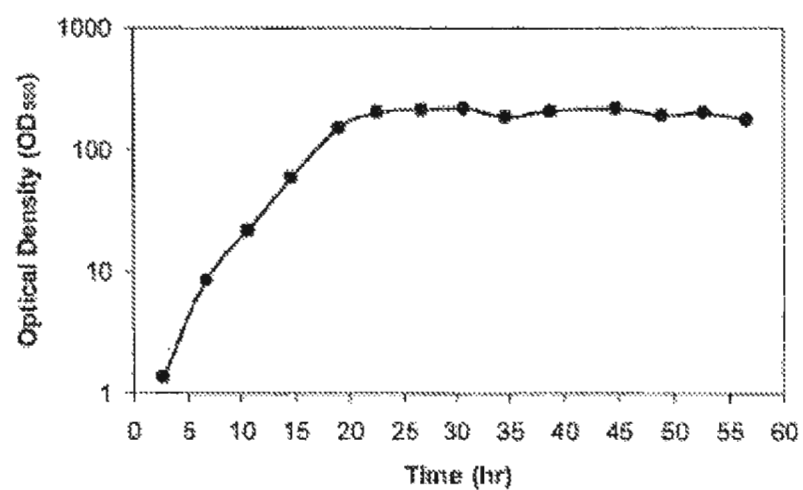


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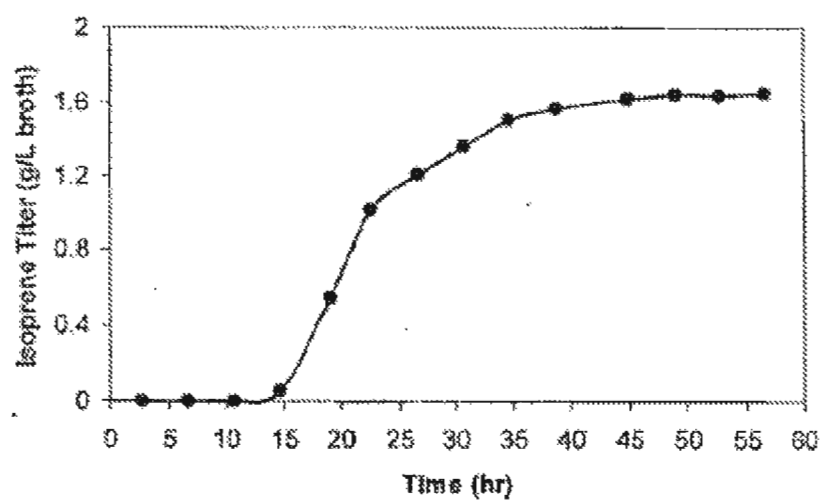


Figure 111C

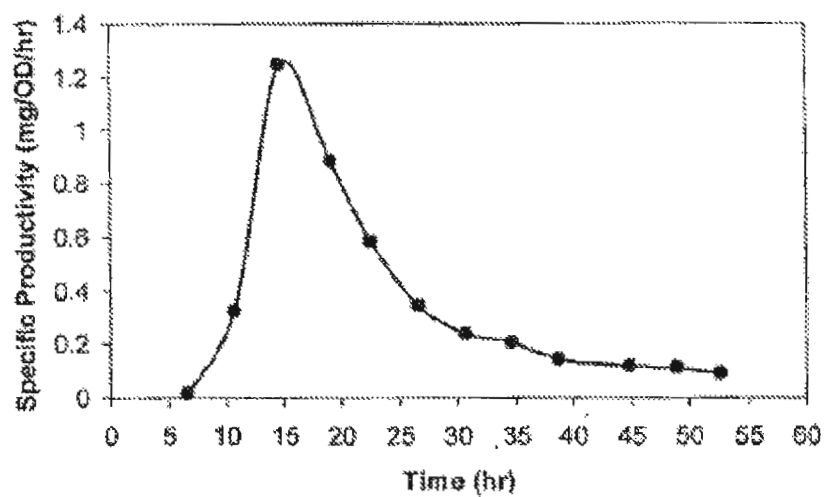


Figure 112A

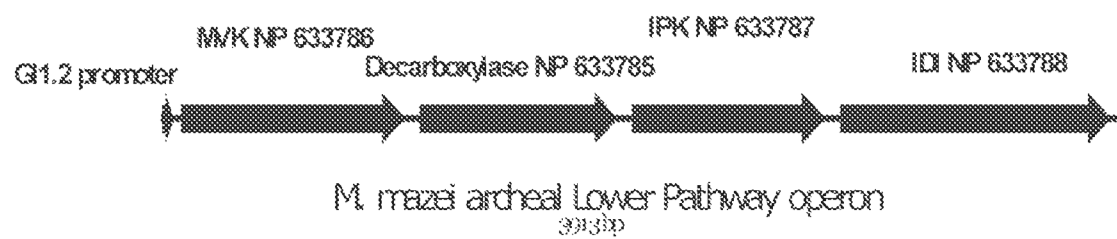


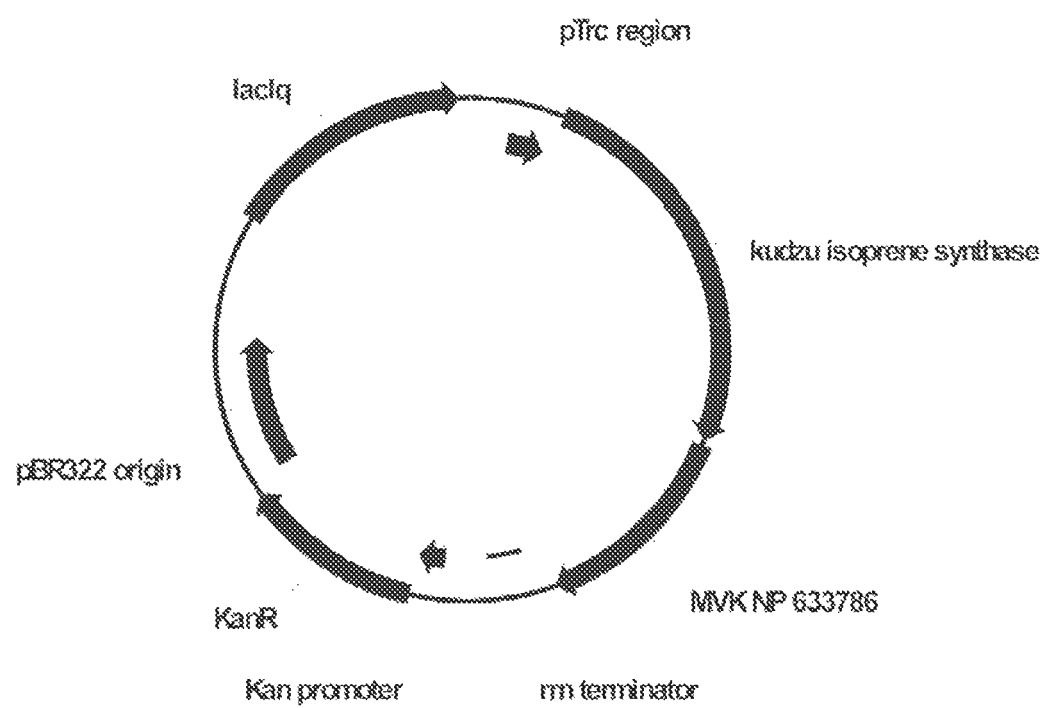
Figure 112B

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Figure 112C

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Figure 113A

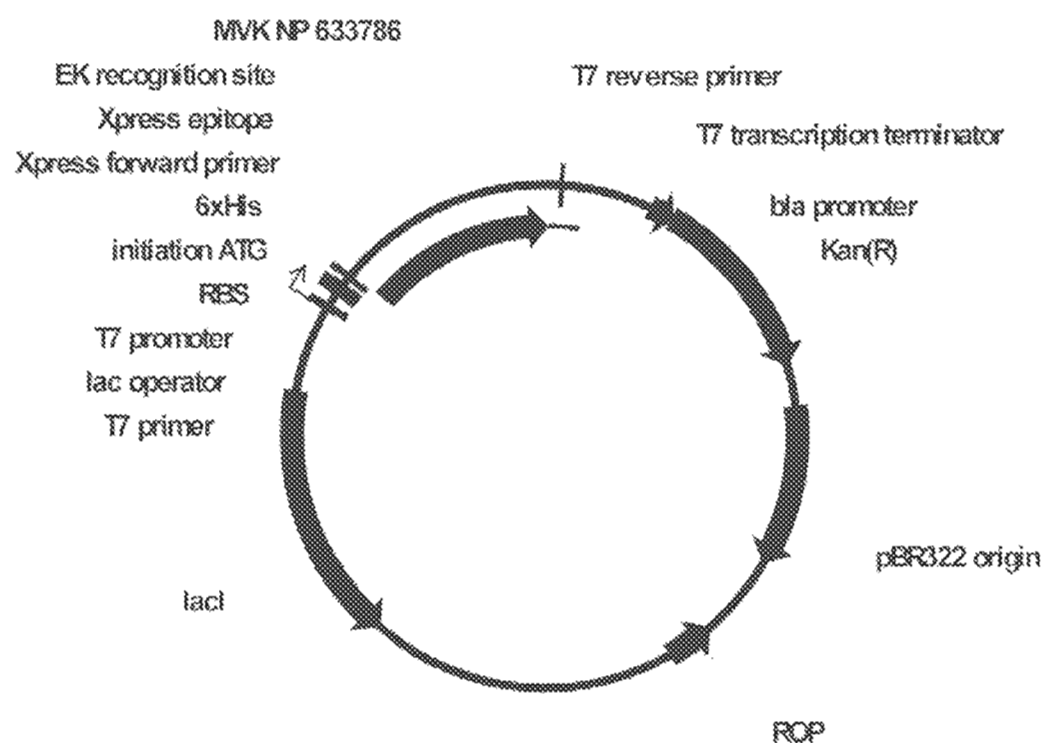


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Figure 114A



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Figure 114B

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Figure 114C

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Figure 115A

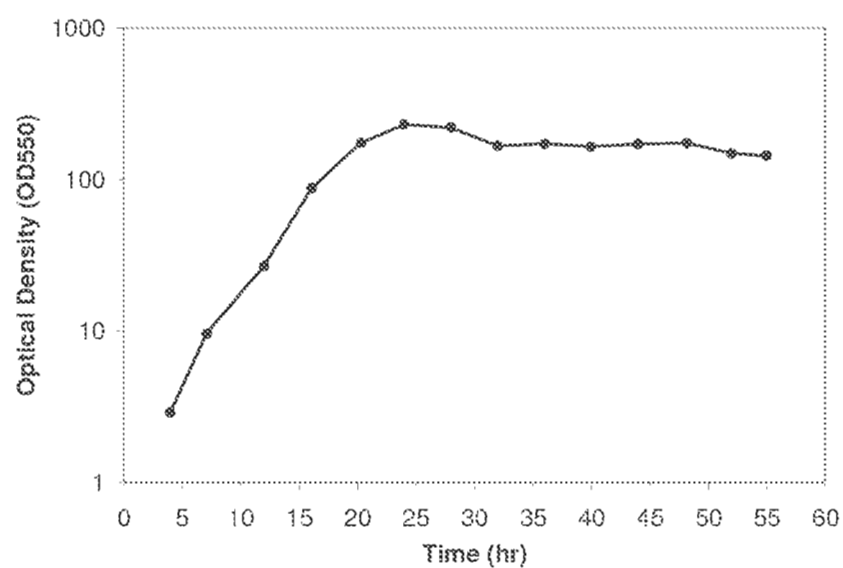


Figure 115B

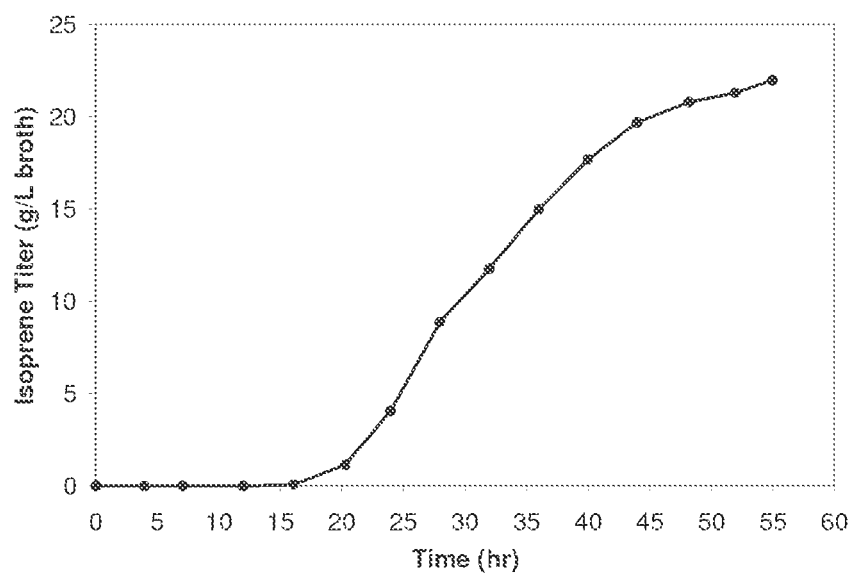


Figure 115C

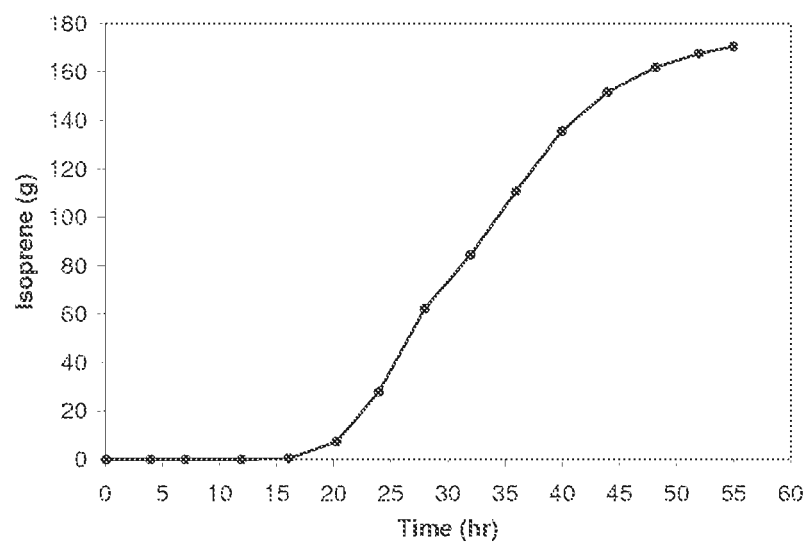


Figure 116

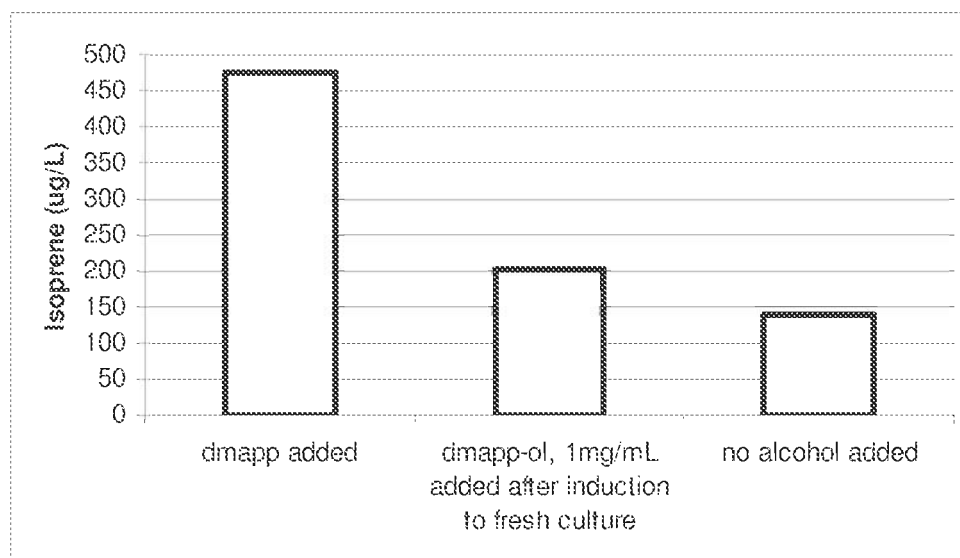


Figure 117A

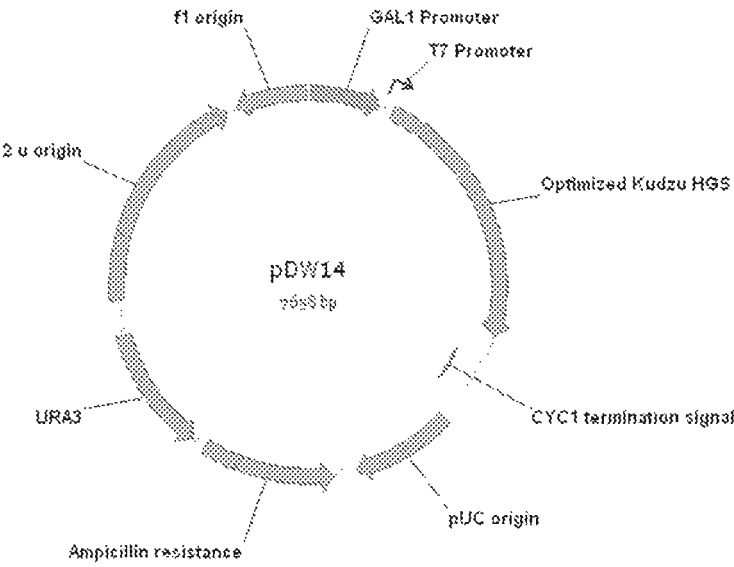


Figure 117B

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Figure 117D

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Figure 118

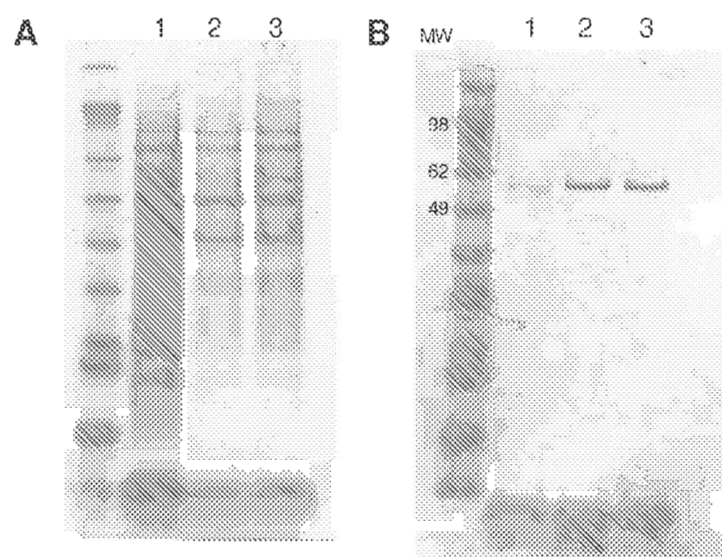


Figure 119

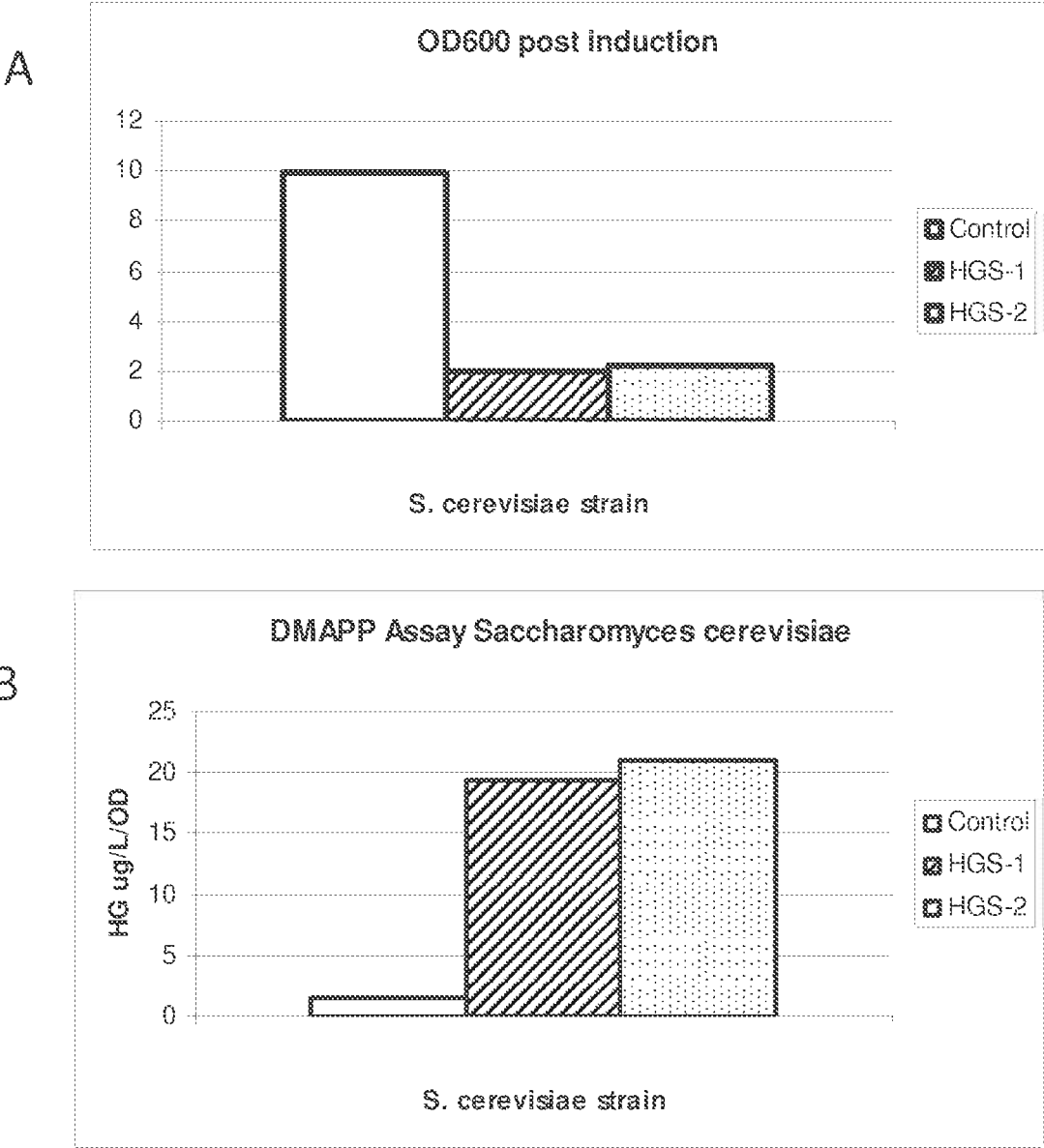


Figure 120

