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Figure 2

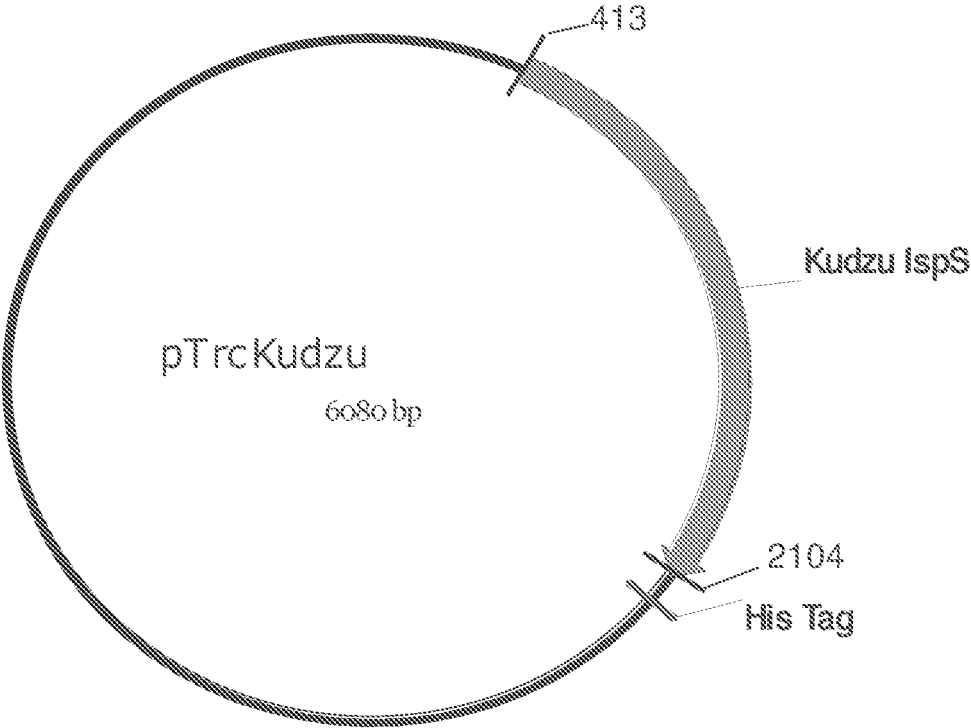


Figure 3A

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Figure 3B

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Figure 3C

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Figure 4

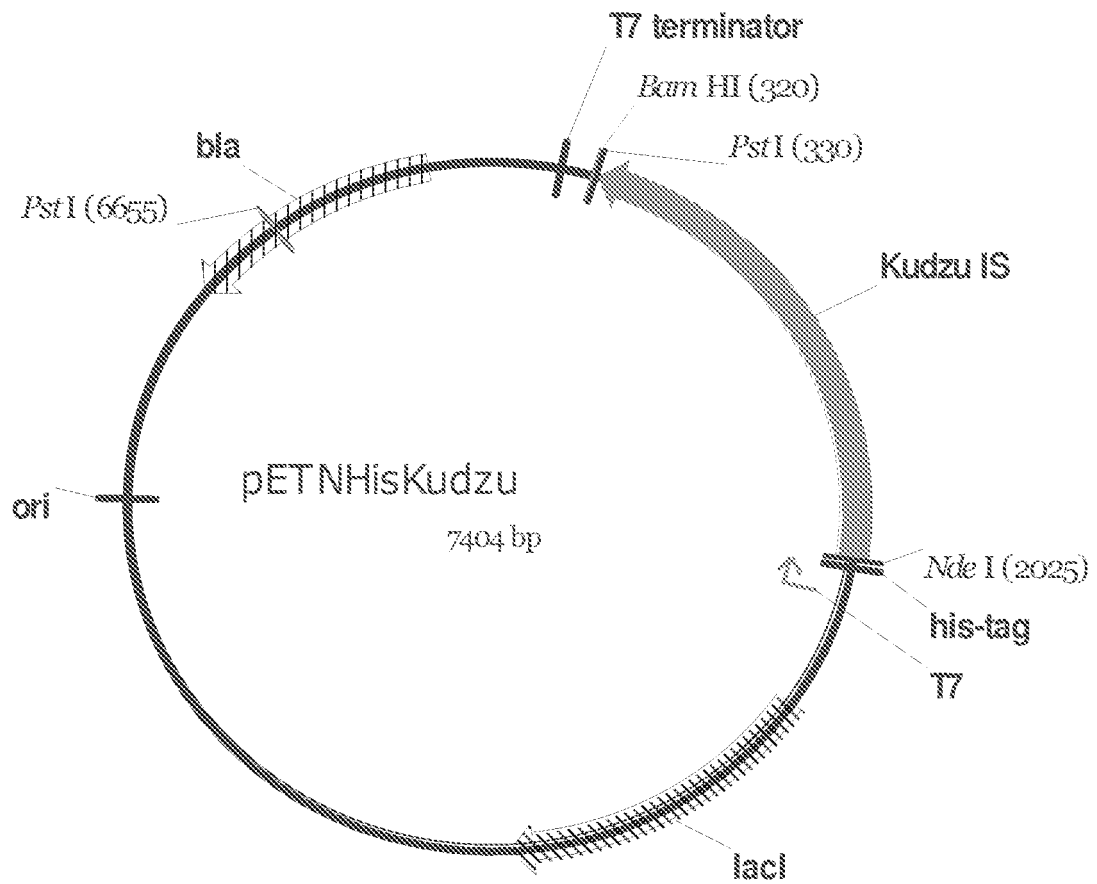


Figure 5A

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Figure 5C

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(SEQ ID NO:5)

Figure 6

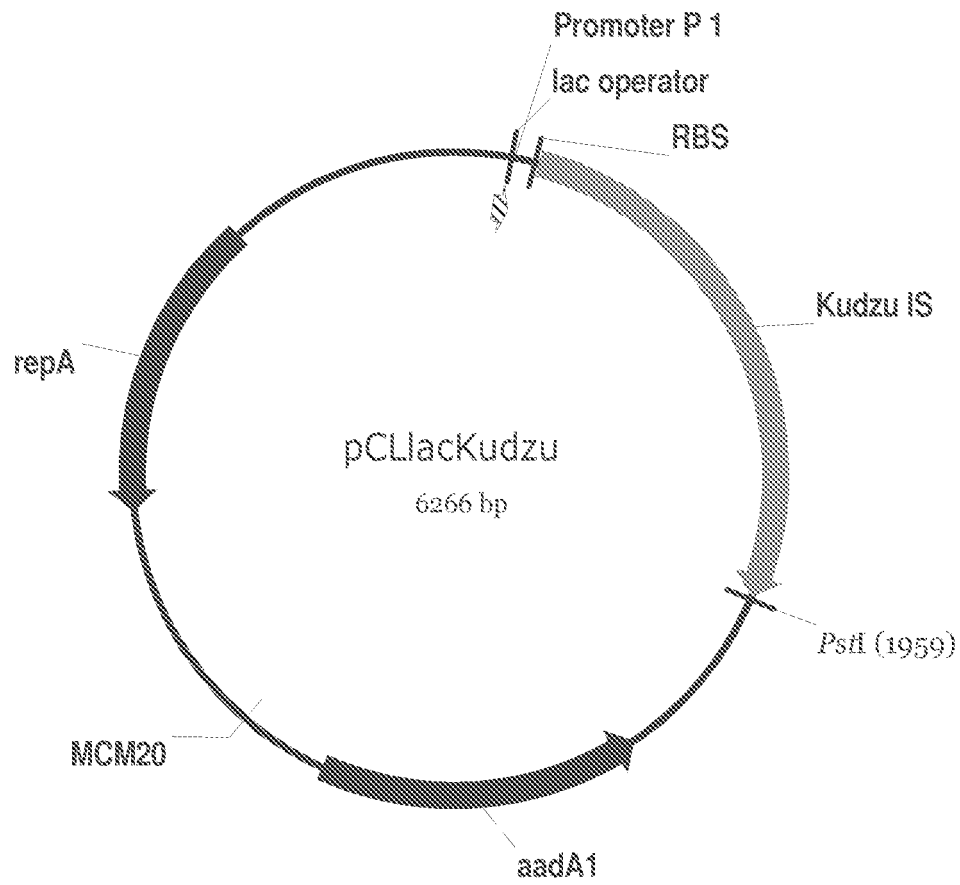


Figure 7A

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Figure 7B

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Figure 7C

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Figure 8A

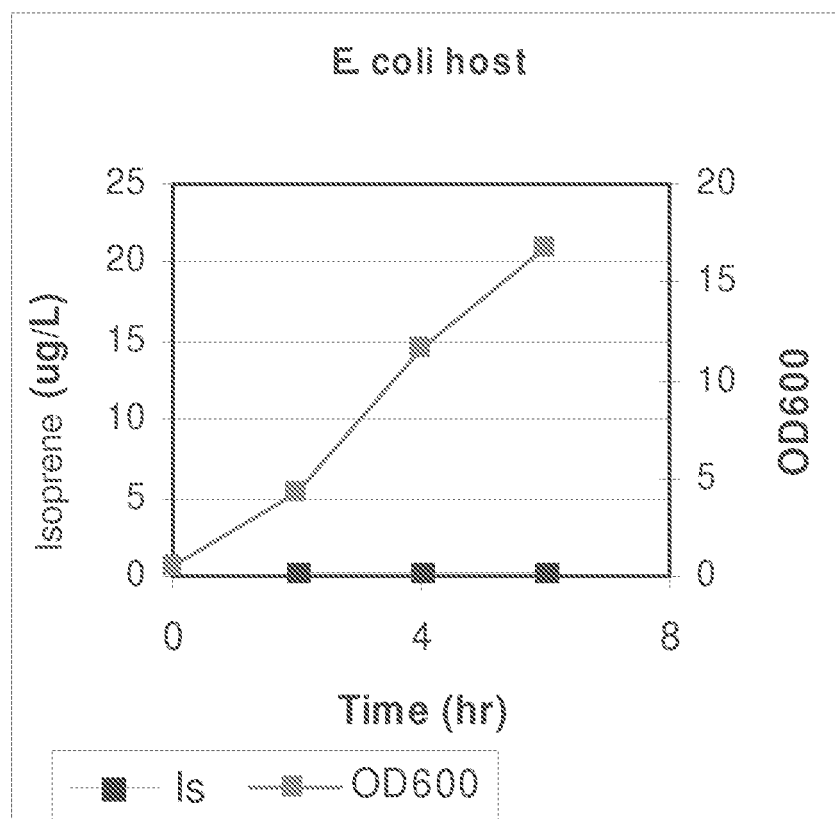


Figure 8B

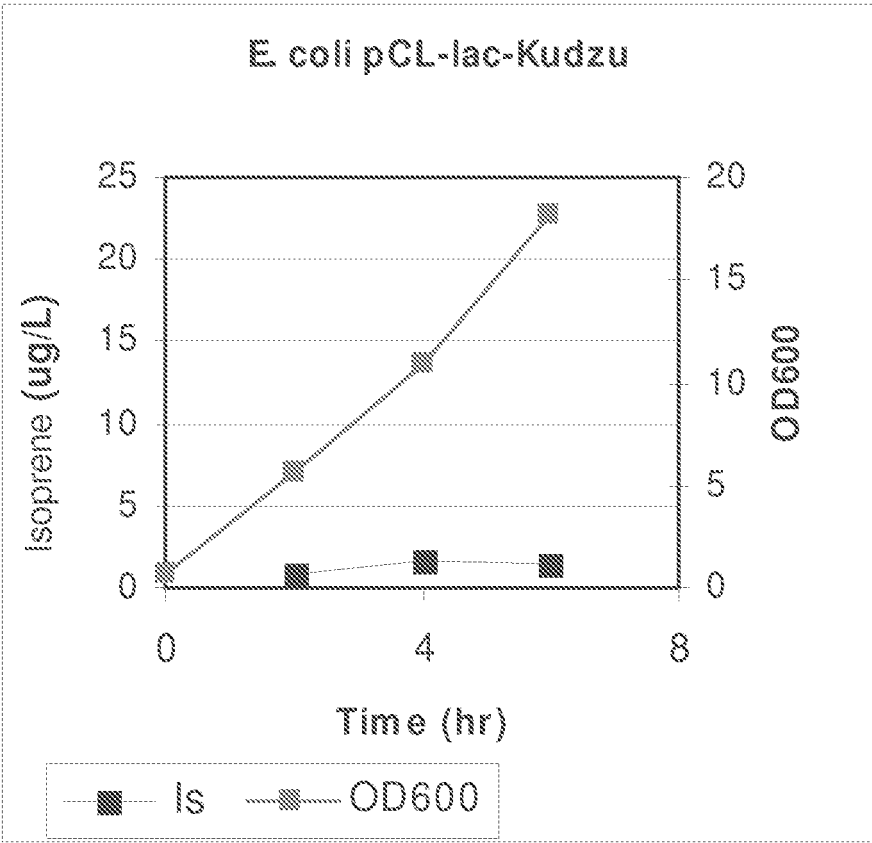


Figure 8C

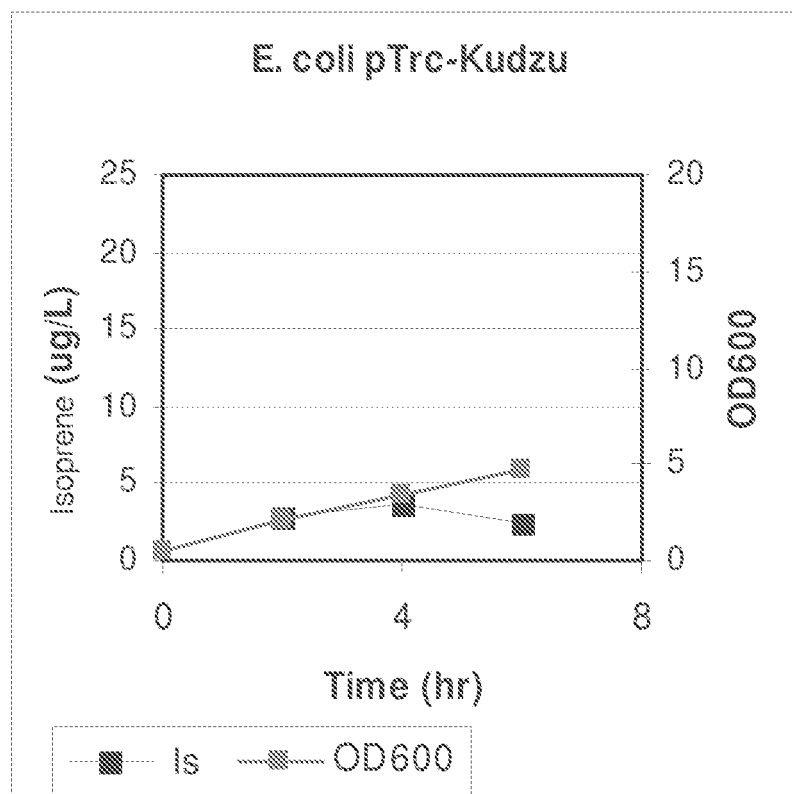


Figure 8D

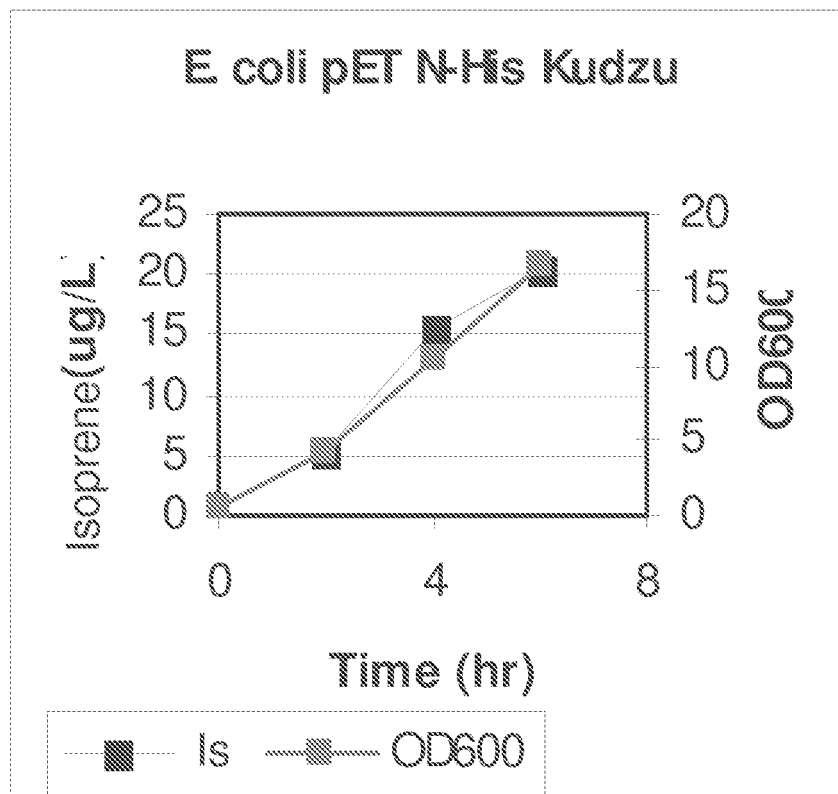
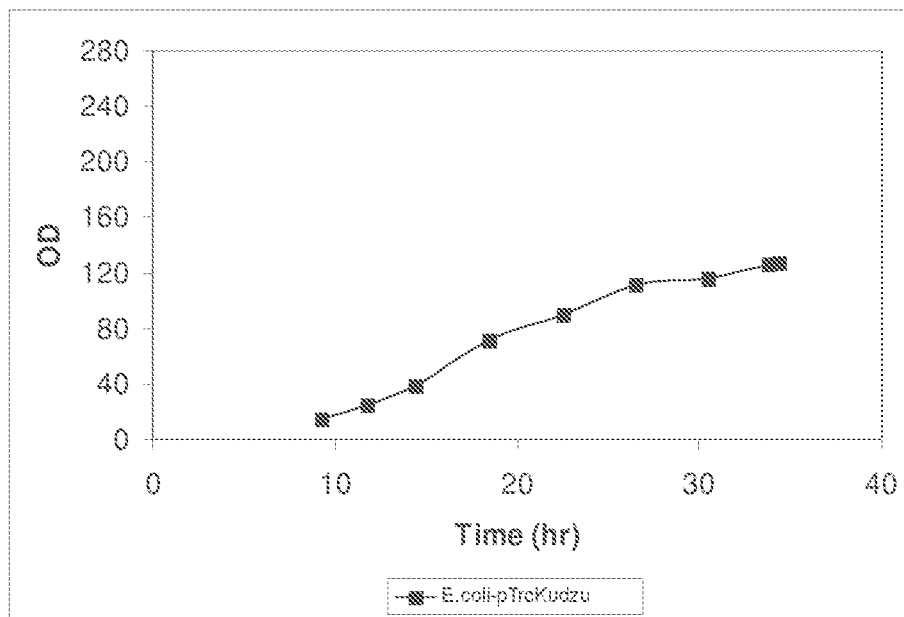


Figure 9

A.



B.

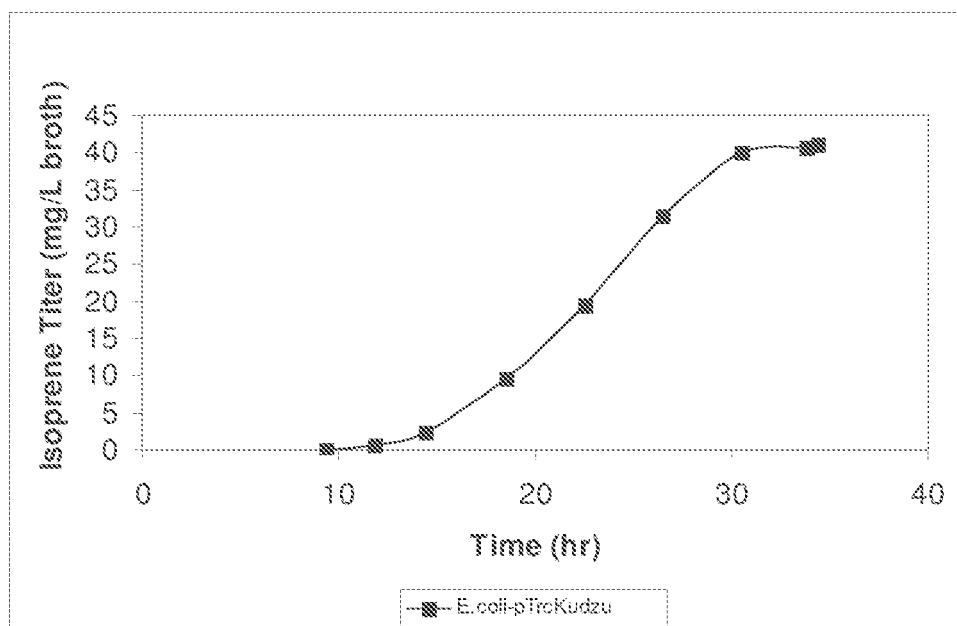


Figure 10A

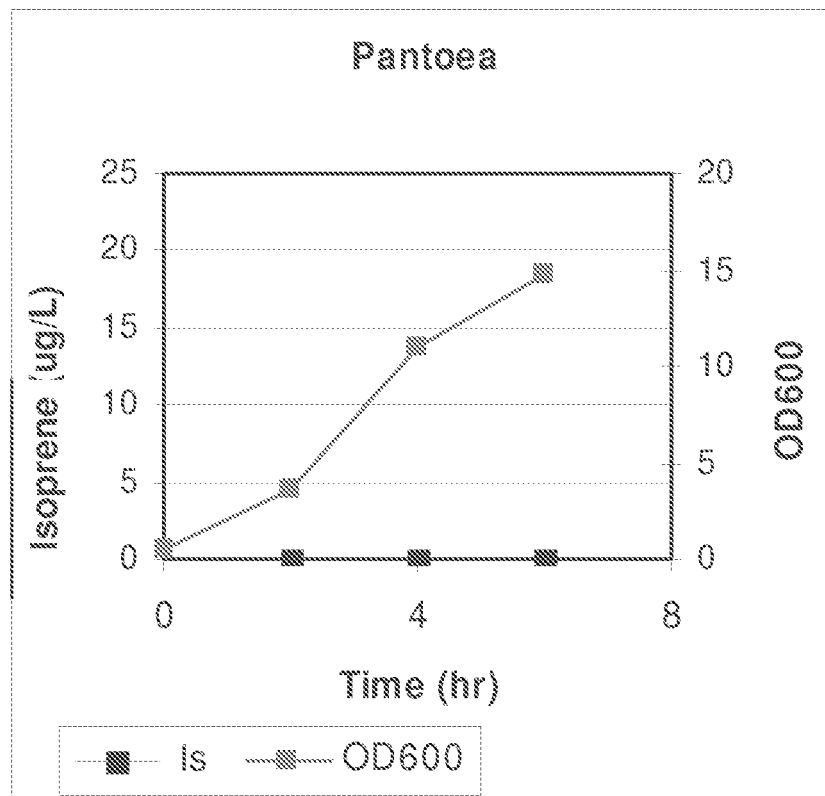


Figure 10B

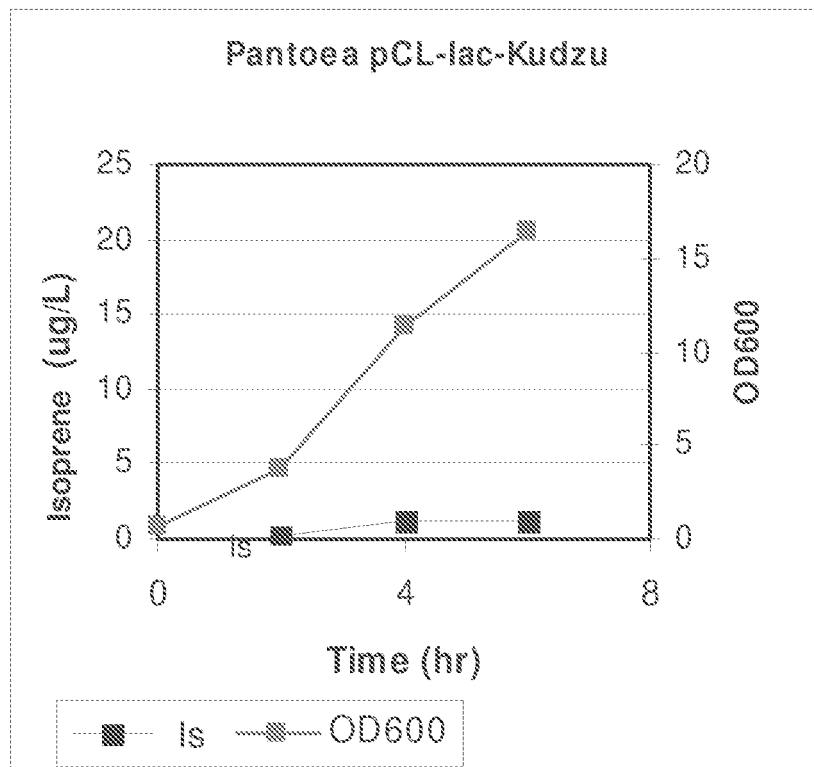


Figure 10C

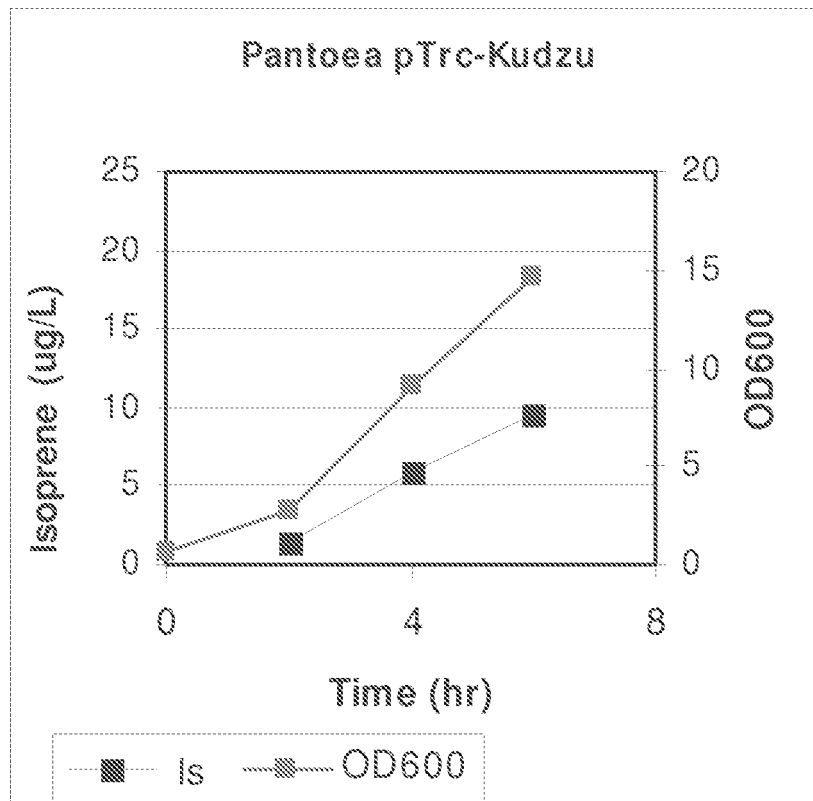


Figure 11

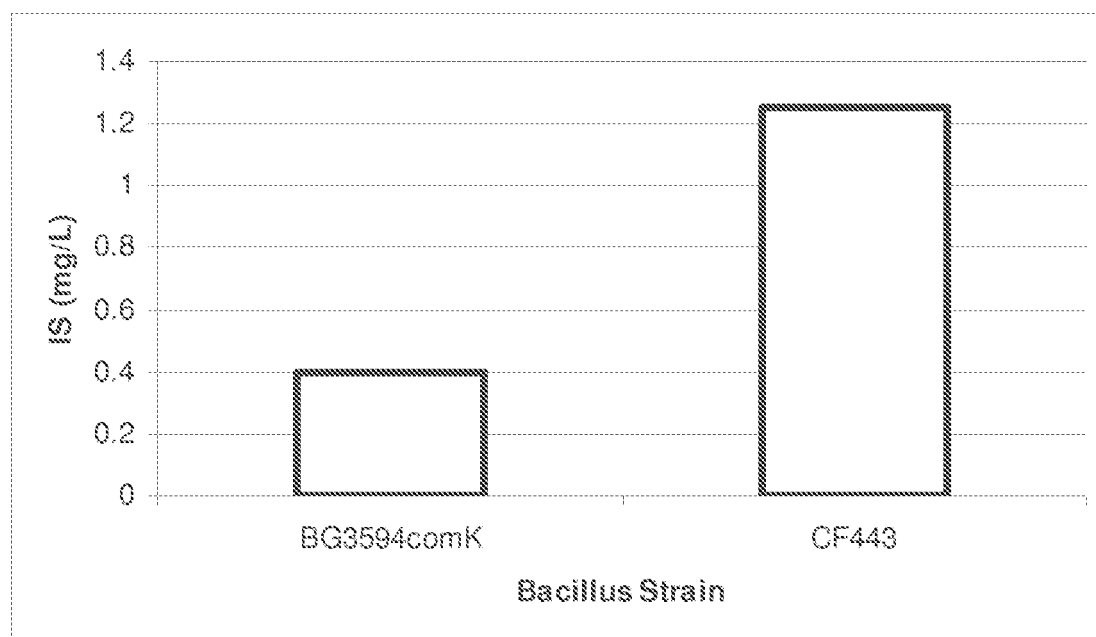


Figure 12A

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Figure 12B

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t g c a g g g t a a a a t t t a t a t c o t t c t t g t t t t a t g t t t c g g t a t a a a a c a c t a a t a t c a a t t t o t
g t g g t t a t a c t a a a a g t c g t t t g t t g g t 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 t o t c t t c c a a t
t g t o t a a a t c a a t t t t a t t a a a g t t c a t t t g a t a t g c o t c o t a a a t t t t t a t o t a a a g t g a a t t
t a g g a g g o t t a c t t g t c t g c t t t c o t t a t t a g a a t c a a t c o t 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 a t t t t a a a a a t a t c c a c t t t a t c c a a t t t t c g t t t g t t g a a c t a a t g g g t
g o t t t a g t t g a a g a a t a a g a c c a c a t t a a a a a t g t g g t c t t t t g t g t t t t t t a a a g g a t t t
g a g c g t a c g c g a a a a a t c o t t t t c t t t c t t t c t t a t o t t g a t a a t a a g g g t a a c t a t t g c c g g t
t g t c c a t t c a t g g o t g a a c t c t g c t t c o t c t g t t g a c a t g a c a c a c a t c a t c t c a a t a t c g g a
t a g g g c c c a t c a g t o t g a c g a c c a a g a g a g o c a t a a a c a c c a a t a g c o t t a a c a t c a t c o c c a t
a t t t a t c c a a t a t t c g t t c o t t a a t t t c a t g a a c a a t c t t c a t t c t t t c t o t o t a g t c a t t a t
t a t t g g t c c a t t c a o t a t t o t c a t t c c c t t t t c a g a t a a t t t t a g a t t t g c t t t t t c t a a a t a a g
a a t a t t t g g a g a g a c c g t t o t t a t t c a g e t a t t a a t a a c t c g t c t t c o t a a g c a t c o t t c a a t
c o t t t t a a t a a c a a t t a t a g o a t o t a a t c t t c a a c a a a o t g g c o c g t t t g t t g a a c t a c t o t t t
a a t a a a a t a a t t t t t c o g t t c c c a a t t c c a c a t t g c a a t a a t a g a a a a t c a t c t t c a t c g g c t
t t t t c g t c a t c a t c t g t a t g a a t c a a a t c g c o t t c t t c t g t g t c a t c a a g g t t t a a t t t t t a t
g t a t t t c t t t t a a c a a a c c a c c a t a g g a g a t t a a c o t t t t a c g g t g t a a a c o t t c o t c c a a a t c
a g a c a a a c g t t t c a a a t t o t t t t c t t c a t c a t c g g t c a t a a a a t c c g t a t c o t t t a c a g g a t a t
t t t g c a g t t t c g t c a a t t g o c g a t t g t a t a t c c g a t t t a t a t t t a t t t t t c o g g t c g a a t o a t t t
g a a c t t t t a c a t t t g g a t c a t a g t o t a a t t t c a t t g c o t t t t t c c a a a a t t g a a t c o a t t g t t t

Figure 12C

ttgattcacgtagttttctgttattctaaaaataagttgggtccacacataccattacatgcatg
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gatttttattaattttttttatattgcatcattoggogaaaatccttgagccatatctgtcaaaact
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aactttaacagatgggggtttttctgtgcaaccaatttttaagggttttcaataactttaaaacaca
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(SEQ ID NO:57)

Figure 13

ATGTGTGCAACCTCCTCCCAGTTTACTCAGATTACCGAGCATAATTCTCGACGATCTGCTAACT
ACCAGCCGAACCTTTTGGAACCTTTGAGTTTCTCCAGTCTCTCGAAAATGACCTGAAGGTGGAAAA
GCTCGAGGAGAAGGCGACCAAACCTCGAGGAGGAGGTGCGATGTATGATCAACAGAGTTGACACC
CAACCCCTGTCTTTGCTGGAGCTGATCGACGATGTGCAGCGGTTGGGTTTGACTTATAAATTTCG
AGAAGGACATTATCAAGGCACTGGAGAACATTGTGCTCCTCGACGAGAACAAGAAGAACAAGTC
TGATCTTCACGCTACCGCTCTCTCTTTCCGACTTCTTCGACAACACGGCTTCGAGGTGTCCGAG
GACGCTTTCGAGAGATTTAAGGACAAGGAGGGAGGATTTAGCGGCGAGCTGAAGGGAGACGTTT
AGGGTCTTCTCTCCTTGTACGAGGCGTCTACCTGGGATTTCGAGGGAGAGAACCTCCTGGAGGA
AGCTCGTACATTTTCCATCACTCACCTTAAGAATAACCTTAAGGAGGGAATTAACACCAAGGTG
GCCGAGCAGTTTTCTCACGCCCTGGAGCTCCCTTACCACCAACGGCTCCATAGACTGGAGGCTC
GTTGGTTTCTGGACAAATATGAGCCAAAGGAGCCTCATCATCAGTTGCTGTTGGAGTTGCCAA
GCTGGACTTCAATATGGTTTCAGACGCTGCACCAAAAGGAGTTGCAGGACCTGTCTCGATGGTGG
ACCGAGATGGGATTGGCCTCGAAGCTGGATTTTGTCCGTGACCGACTTATGGAGGTCTATTTTT
GGGCCCTTGGGAATGGCGCCTGACCCCCAGTTCCGAGAGTGCCGGAAGGCGGTGACGAAGATGTT
CGGTCTTGTGACTATCATCGACGACGTCTACGATGTCTACGGCACACTCGACGAGTTGCAGCTG
TTCACTGACGCCGTGAGCGATGGGATGTGAACGCCATTAATACTCTCCCTGACTATATGAAGC
TGTGCTTCTTGGCTCTGTACAACACTGTCAACGATACCTCGTACTCTATCCTCAAGGAGAAGGG
ACACAACAATCTCTCCTACTTGACCAAATCCTGGCGAGAAGTGTGCAAGGCTTTTTCTGCAGGAG
GCTAAATGGTCCAATAACAAGATCATTCCTGCTTTTTTCTAAATACCTGGAAAATGCCTCGGTGT
CGAGCTCTGGCGTGGCCCTTCTGGCCCTTCTTACTTCTCCGTCTGCCAGCAGCAGGAGGATAT
TTCCGATCATGCTCTTAGATCGCTGACCGATTTTCACGGCCCTCGTGGATCTTCTGCGTGATT
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CCATTATTTCTTACATGCACGAAAACGATGGAACATCTGAAGAACAGGCTAGAGAGGAACTGCG
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CCCAAGGCCTTCATGGAGATCGCCGTGAACATGGCTCGAGTTTCCATTGTACTTACCAGTACG
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CTTCCCTATCAACCAATTGATGTACGTGTAA

(SEQ ID NO:8)

Figure 14

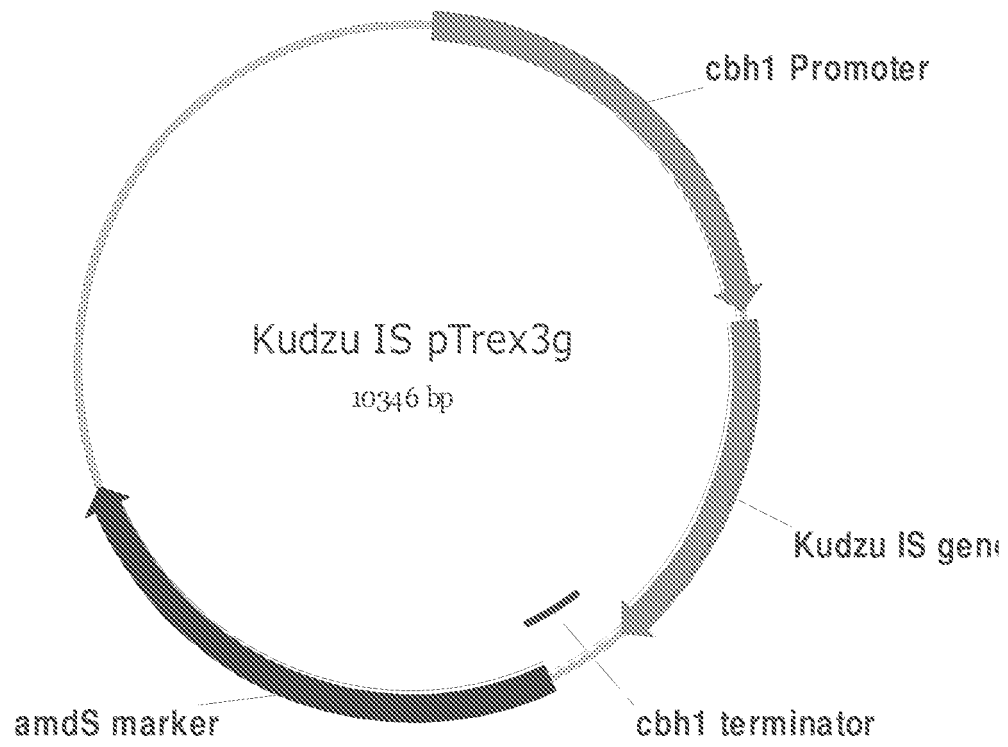


Figure 15A

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1  TCGACCGGTG AGAAGAACAG CATCGGGACA AGGGAAGGAA GAACAAAGAC AAAGAAAACA
61  AAAAGAAAGCA ATTGAAAACA AAACAAAACA ATTTTCATTG CTCTCTTAT CATTCCTTTT
121  CTTTTCTTTT CTCTCATTC ACGCACTCCA TCGTATCGGT ATTCTCTTA TTTTTCTCT
181  TTCTCTATAT CCATTCTTT CTCTCTAGGT GTGTCCTCTC TCTCTCTCA ATTTCTCTAC
241  TCCGCATTCC AACGCATCCT TCCCCCAACC TCCCATTTCC TCCTTACGGC CCGATAGCGA
301  TCGTCTTTCC CTCGCTATCA CTCGCTACCG GCCCCCTCTC TGCACCGTAA CCTCCACGT
361  ATTTACCATA TCAIAAAGTT TTTTCGACG CTTATCGGTG ACCCCCTGTC GCCCTCCTAT
421  TGGCTTCCGG ATTATCTTCT TGTCATAAG GTGATCCATG CTTCCTGAAG ATTCGGGAAA
481  TGTGTCCACT TTGGGGGGGA ATCATTCAT CCACTTCTTT CTCTCTCGCT TTCCTCATTC
541  GGGGCTCCCC TTCCGCGTCT CATTGGTCTT CCGCTCGGTT TTGCTTTGC CGATGTTACT
601  TGGGGAGAGG TCGGATAATC CTTTCGCAAA AACTCGGTTT GACGCTTCCC ATGGTATAAA
661  TAGTGGGTGG TGGACAGGTG CCTTCGCTTT TCTTAAAGCA AGAGAATCCC ATTTGCTTGA
721  CTATACGAA TTCACATACA TTAAGAAGAT CACCGCTGTC ATTGCCCTTT TATTCTCAT
781  TGCTGCTGCC TCACCTATTC CAGTTGCCGA TCTGGGTGTG GTTTCAGTTA GCAAGTCAAT
841  TGCTGATTTT CTTCGTGTTT ACCAAAGTTG GAACACTTTT GCTAATCCTG ATAGACCCAA
901  CTTTAAGAAG AGAAATGATA CACCTGCAAG TGGATATCAA GTTGAAGGAG TCGTAAATTT
961  GTCACGTCAC GGTGTTAGGG CCCCACAAA AATGACTCAA ACCATGCGTG ATGTCACTCC
1021  TAATACATGG CCAGAATGGC CCGTAAATTT AGGATATATT ACACCAAGAG GTGAACACTT
1081  GATATCACTT ATGGGCGGTT TTTACCGTCA AAAATTCAG CAACAAGGAA TCCTTTCTCA
1141  GGGCTCCTGT CCACTCCTA ACTCCATATA TGCTGGGCT GACGTGATC AGCGTACTTT
1201  AAAAAGTGGT GAAGCAITCC TTGCTGGTTT GGCACCACAA TGTGGCTTGA CAATTCATCA
1261  CCAACAAAAT CTTGAGAAAG CTGATCCTCT TTTTCATCCC GTTAAAGCTG GAACCTGCTC
1321  TATGGATAAA ACTCAAGTTC AACCAAGCTG TGAGAAAGGAG GCACAAACTC CTATAGATAA
1381  TTTGAATCAA CATTACATCC CCTTTTAGC TTTAATGAAT ACAACATTAA ATTTTAGTAC
1441  TTCTGCCCTG TCCCAAAAAC ACTCTGCTGA TAAATCCTGT GACCTAGGTT TATCCATGCC
1501  TTCTAAATTC TCCATAAAAG ATAATGGTAA CAAGGTCGCA TTGGATGGAG CTATTGGTCT
1561  ATCCTCTACT TTGGCCGAGA TTTTCTTCT TGAATATGCT CAAGGCAAGC CTCAGGCTGC
1621  TTGGGGTAAC ATCCACTCAG AGCAAGAGTG GGCTTCCTTG CTAAAGTTC ATAATGTTCA
1681  ATTCGATTTG ATGGCCCGAA CACCTTATAI TGCTCGACAT AACGGTACTC CTTTATTGCA
1741  AACTATAACA AATGCCCTTA ATCCCAACGC CACTGAATCA AAACCTCCAG ATATTTCACC
1801  TGAATAACAA ATATTGTTCA TTGCAAGTCA TGACACAAAT ATTGCTAATA TAGCCGCGAT
1861  GTTAAATATG CGTTGGACAT TACCAGGTCA ACCAGATAAT ACTCCTCCAG GTGGTGCCCT
1921  AGTATTTGAA CGTCTTGCTG ATAAAAGTGG AAAACAATAT GTTCTGTAT CTATGTTTAA
1981  TCAAAACATA GAACAAGTTC GATCAGAGAC TCCCTTTCT CTAAATCAGC CTGCCGGATC
2041  TGTTCAACTT AAAATTCAG GTTGCAATGA TCAAACAGCC GAGGGTACT GTCTCTTTT
2101  CACTTTTACA AGAGTTGTT CCCAATCTGT TGAACCTGGA TGCCAACCTC AATAATGAGG
2161  ATCCAAGTAA GGGATGAGA ATGTGATCCA CTTTAAATTC CTAATGAATA CATGCCATAA
2221  GTTCTTTTCT TTTGTTCTTT ATGCTGTTT TCGATGGTAC GGGCGTTGTC AATCTCAGTT
2281  TGTGTGCTTG GTTGCAGCTT GGTTTCAAA CTGTTCTATCT CATGAATCTT TTACCATTTT
2341  ACCACAGCTT TATACCATTC TCTCATAGAA TCTTCATCAA ACCATCTCGG GGTTAGAGTG
2401  GAAAGAAAGT CTGTTCTTT TATTTCTTT TTTCCATCTT CAAGGCTTTT CTTTTCTTCC
2461  TCTCCTCGT TCATCTTGAG GTTTGACGTG TCTGTTTAGA ATTTTGAGCT GTTGCAGCAT
2521  CTTATTTTTT GTTTTGCGAA AACGAAGCGC TTTACTCTCT TCATCAGTTG GACGATTTTA
2581  CCTTTGAAAA CCAACTACTT TTGCATGTTT TGTATAGAAA TCAATGATAT TAGAATCCCA
2641  TCCTTTAATT TCCTTCAAAG TAGTTGAGCT ATAGTTAAGT GTAAGGGGCC TACTGGGAAA
2701  GCATTTGCCA AGGATGTTTT CATTAAATCA GAACGAAAGT TAGGGGATCG AAGACGATCA
2761  GATACCGTCT TAGTCTTAAC CATAAACTAT GCCGACTAGG GATCGGGCAA TGTTTCATTT
2821  ATCGACTTGC TCGGCACCTT ACGAGAAATC AAGTCTTTG GGTTCGGGGG GGAGTATGGT
2881  CGCAAGGCTG AAACTTAAAG GAATGACGG AAGGGCACCA CAATGGAGTG GAGGCTGGGG
2941  CTTAATTTGA CTCAACACCG GGAACTCAC CAGGTCCAGA CATAGTAAGG ATTGACAGAT
3001  TGAGAGCTCT TTCTTGATTC TAIGGGTGGT GTTGCATGGC CGTCTTATG TGGTGGAGTG
3061  ATTTGCTGCT TTAATTGCGA TAACGAACGA GACCTTAACC TGCTAAATAG CTGGATCAGC
3121  CATTTTGGCT GATCAITAGC TTCTTAGAGC GACTATTGGC ATAAAGCCAA TGGAACTTTG
3181  AGGCAATAAC AGGTCTGTGA TGCCCTTAGA TGTCTGGGC CGCACGGCGG CTACACTGAC
3241  GGAGCCAAAG AGTTGAAAAA AATCTTTTGA TTTTATATCC TTGGCCGGAA GGTCTGGGTA
3301  ATCTTGTATA ACTCCGTCTG GCTGGGGATA GAGCATTGCA ATTAATGGCG CCGCTCTCTA
3361  ATTCGATGTT GCAGATTTTA CAAGTTTTTA AAATGTAATT CATIATTACT TTTTATAATG
3421  CTAATAAAAA AGCCATAGTT TAATCTATAG ATAACTTTTT TTCCAGTGCA CTAACGAGCG

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Figure 15B

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3481 TTACATTCOC ATACAAAAC TCGTAGTTAA AGCTAAGGAA AAGTTAATAT CATGTTAAIT
3541 AAATACGCTA TTTACAATAA GACATTGAAC TCAITTTATAT CGTTGAATAT GAATAACCAA
3601 TTTCAGCGAA TTTTAAACAA ACATCGTTCA CTTGGTTTTAA GGATATCTTG TGTATGGGGT
3661 GTFGACTTGC TTTATCGAAT AATTACCGTA CTTGTAAATTG GCTTGGCTGG TATAGCGGTA
3721 GTCTAATATC TAGCAAAAAT CTTTGGGGTG AAAAGGCTTG CAATTTTCAG ACACCGAACT
3781 ATTIGTCAIT TTTTAAATAA GAAGTTTTC ATAAATTCCT GTAAITCTCG GTTGAICTAA
3841 TTGAAAAGAG TAGITTTTGA TCACCATGAG GAGGGCTTTT GTAGAAAGAA ATACGAAAGA
3901 AACGAAAATC AGCGTTGCCA TCGCTTTTGA CAAAGCTCCC TTACCTGAAG AGTCGAATTT
3961 TATTGATGAA CTTTATAACT CCAAGCATGC AAACCAAAAG GGAGAACAAG TAATCCAAGT
4021 AGACACGGGA AITGGATTCT TGGATCACA GTATCATGCA CTGGCTAAAC ATGCAGGCTG
4081 GAGCTTACGA CTTTACTCAA GAGGTCATTT AATCATCGAT GATCATCACA CTGCAGAAGA
4141 TACIGCTATT GCACITGGTA TTGCATTCAA GCAGGCTATG GGTAACTTTG CCGGCGTTAA
4201 AAGATTITGA CATGCTTATT GTCCACTTGA CGAAGCTCTT TCTAGAAGCG TAGTTGACTT
4261 GTGGGACGG CCTATGCTG TTATCGATTT GGGATTAAAG CGTGAAGAGG TTGGGGAAT
4321 GTCTGTGAA ATGATCCCTC ACTTACTATA TTCTTTTTCG GTAGCAGCTG GAATTAATTT
4381 GCAITTTACC TGCTTATAAG GTAGTAAATG CCATCATCGT GCTGAAGAGG CTTTAAATC
4441 TCTGGCTGTT GCCATGCGG CGGCTACTAG TCTTACTGGA AGTTCTGAAG TCCCAAGCAG
4501 GAAGGAGTGT TTGTAAAGAT GAATGGATT ATGTCAGGAA AAGAACGACA ATTTTGCATC
4561 CAAATTGTCT AAATTTTAGA GTTGTCTGAA AACAATAGAA CCTTACTTGC TTTATAATTA
4621 CGTTAAITAG AAGCGTATC TCGTGAAGGA ATATAGTACG TAGCCGTAATA AATTGAATTG
4681 AATGTTTACG TTATAGATAA GAGACACTTT GTTGTTCAT CCGTCGTCAC TTACCATACT
4741 CACTTTATTA TACGACTTAA AGTATAAAT CCGCGGTTAT GGTAAATTA ATGATGCACA
4801 AACGTCCGAT TCCATATGGG TACACTACAA TTAATAACTT TTAAGCTGAT CCCCCACACA
4861 CCAATAGCTT AAAATGTTTC TACTCTTTT TACTCTTTC AGATTTTCTC GGACTCCGCG
4921 CATCGCCGTA CCACTTCAAA ACACCCAGC ACAGCATACT AAATTTTCCC TCTTTCTTCC
4981 TCTAGGGTGT CGTTAAITAC CCGTACTAAA GGTTTGGAAA AGAAAAAGAA GACCGGCTCG
5041 TTTCTTTTTC TTGCTCGAAA AAGGCAATAA AAATTTTAT CACGTTTCTT TTTCTTGA
5101 TTTTCTTTTC TAGTTTTTTT CTCTTTTCA GTACCTCCAT CATATTTAAG TTAATAAAG
5161 GTCTTCAAIT TCTCAAGTTT CAGTTTCAIT TTTCTTGTTC TATTACAAC TTTTTCAT
5221 CTTGTTTCAIT AGAAAGAAAG CATAGCAATC TAATCTAAGG GCGGTGTTGA CAATTAATCA
5281 TCGGCATAGT ATATCGGCAT AGTATAATC GACAAGGTGA GGAACATAAC CATGGCCAG
5341 TTGACCAGTG CCGTTCCGGT GCTCACCGCG CCGACGTCG CCGGAGCGGT CGAGTTCTGG
5401 ACCGACCGGC TCGGTTTCTC CCGGCACTTC GTGGAGGAG ACTTCGCGCG TGTGGTCCG
5461 GACGACGTA CCGTGTTCAT CAGCGCGGTC CAGGACGAG TGGTGGCGGA CAACACCTG
5521 GCTGGGTGT GGTGCGCGG CCTGGACGAG CTGTACGCG AGTGGTGGGA GGTGCTGTC
5581 ACGAACTTCC GGGACGCTC CCGGCGGCG ATGACCGAGA TCGGCGAGCA GCGGTGGGG
5641 CCGGAGTTCC CCGTGGCGA CCGGCGCGC AACTGCGTGC ACTTCGTGGC CGAGGAGCAG
5701 GACTGACAGC TCCGACGCG GCGGACGGT CCGAGGCTC GGAGATCCGT CCCCCCTTTC
5761 CTTTGTCTAT ATCATGTAA TAGTTATGTC ACGCTTACAT TCACGCGCTC CCCCCACATC
5821 CCTCTTAAAC GAAGAAGAA GAGTTAGACA ACCTGAAGTC TAGGTCCCTA TTTATTTT
5881 TATAGTTATG TTAGTATTA GAACGTTAAT TATATTTCAA ATTTTCTT TTTTCTGTA
5941 CAGACGCGAG CTTCCAGTA AATGTGCCAT CTCGTAGGCA GAAACGCTT CCCCCGTAGG
6001 GTCTCTCTCT TGGCCCTCT TCTAGGTGG GTGATTGCT CTTGAAGCTC TCTAGGGGG
6061 CTCACACCAT AGGCAGATA CGTTCCCAAC CCGCTCGCT CTTAAGCGCA CAAGGACIGC
6121 TCCCAAGAT CCTAGGCGG ATTTTGGCGA TTTCGGCTTA AAGGAACGG AACACSTAGA
6181 AAGCCAGTCC GCAGAAACGG TGCTGAACCC GGATGAATGT CAGCTACTGG GCTATCTGGA
6241 CAAGGGAATA CCGAAGCGCA AAGAGAAAGC AGGTAGCTTG CAGTGGGCTT ACATGGCGAT
6301 AGCTAGACTG GCGGTTTTA TGGACAGCA GCGAAGCGGA ATTGCCAGT GGGGCGCCCT
6361 CTGGTAAGGT TGGGAAGCC TCGAAAGTAA ACTGGATGCC TTTCTTGGCG CCAAGGATCT
6421 GATGGCGCAG GGGATCAAGA TCTGATCAAG AGACAGGATG AGGATCGITT CGCATGATG
6481 AACAAAGATG ATTGCAAGCA GGTCTCTCG CCGCTTGGGT GGAGAGGCTA TCGGCTATG
6541 ACPGGGCACA ACAGACAATC GGTGCTCTG ATGCGCGCT GTTCCGGCTG TCAGCGCAGG
6601 GCGGCGCGT TCTTTTGTG AAGACCGACC TGTCCGGTGC CCTGAATGAA CTGCAGGAGC
6661 AGGCAGCGCG GCTATCTGCT CTGGCCAGCA CCGGCGTTCC TCGGCGAGT GTGCTCGAGC
6721 TTGTCACTGA AGCGGGAAG GACTGCTGCT TATGGGCGA AGTCCGGGG CAGGATCTCC
6781 TGTCACTCTG CCTTGTCTCT CCGGAGAAAG TATCCATCAT GGTGATGCA ATGCGGCGGC
6841 TGCATACGCT TGATCCGCT ACCTGCCCC TCGACCAACA AGCGAARCAT CGCATGAGC
6901 GAGCACGTAC TCGGATGGA CCGGCTTTG TCGATCAGGA TGATCTGGAC GAAGAGCATC
6961 AGGGGCTCGC GCGAGCGGAA CTGTTCGCGA GGCTCAAGGC GCGCATGCC GACCGCGAGG

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Figure 15C

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7021 ATCTCGTGGT GATCCATGGC GATGCGTGCT TCCCGAATAT CATGGTGGAA AATGGCCGCT
7081 TTTCTGGATT CAACGACTGT GGCCGGCTGG GTGTGGCGGA CCGCTATCAG GACATAGCGT
7141 TGGATACCCG TGATAATTGCT GAAGAGCTTG GCGCGGAATG GCGTGACCGC TTCCTCGTGC
7201 TTTACGGTAT CGCCGCTCCC GATTCCGAGC GCATCGCCTT CIATCGCCTT CTTGACGAGT
7261 TCTTCTGAAT TGA AAAAGGT ACCAAGTTTA CTAATATA CTTTAGATTG ATTTAAACT
7321 TCAITTTTAA TTTAAAAGGA TCTAGGTGAA GATCCTTTTT GATAATCTCA TGACCAAAAT
7381 CCGTTAACGT GAGITTTTCT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
7441 TTCTTGAGAT CCTTTTTTTC TGCGCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT
7501 ACCAGCGGTG GTTTGTITGC CGGATCAAGA GCTACCAACT CTTTTTCOGA AGGTAACTGG
7561 CTTGAGCAGA GCGCAGATAC CAAATACTGT CTTTCTAGTG TAGCCGTAGT TAGGCCACCA
7621 CTTCAAGAAC TCTGTAGCAC CGCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC
7681 TCGTGGCAGT GCGGATAAGT CGTGICTTAC CCGGTTGGAC TCAAGACGAT AGTTACCGGA
7741 TAAGGCGCAG CCGTGGGGCT GAACGGGGGG TTCTGTGCACA CAGCCCAGCT TGGAGCGAAC
7801 GACCTACACC GAAGTGAGAT ACCTACAGCG TGAGCATTTA GAAAGCGCCA CGCTTCCCGA
7861 AGGAGAGAAAG GCGGACAGGT ATCCGGTAAG CCGCAGGGTC GGAACAGGAG AGCGCAGGAG
7921 GGAGCTTCCA GGGGGAAACG CCTGGTATCT TTATAGTCTT GTCGGGTTTC GCCACCTCTG
7981 ACTTGAGCGT CGATTTTGT GATGCTCGTC AGGGGGCGG AGCCTATGGA AAAACGCCAG
8041 CAACGCGGCC TTTTACGGT TCCTGGCCTT TTGCTGGCT TTTGCTCACA TGTTCTTTCC
8101 TGGCTTATCC CCTGATCTG TGGATAACCG TATTACCGCC ITTGAGTGAG CTGATACCGC
8161 TCGCCGACG CCAACGACCG AGCGCAGCGA G
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(SEQ ID NO:11)

Figure 16

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1  GAATTCAAAA CAAATGTGT GCAACCTCCT CCCAGTTTAC TCAGATTACC GAGCATAATT
61  CTCGACGATC TGCTAACTAC CAGCCGAACC TTGGAACTT TGAGTTTCTC CAGTCTCTCG
121 AAAATGACCT GAAGGTGGAA AAGCTCGAGG AGAAGGCGAC CAAACTCGAG GAGGAGGTGC
181 GATGTATGAT CAACAGAGTT GACATCCAAC CCTGTCTTT CCTGGAGCTG ATCGACGATG
241 TGCAGCGGTT GGGTTTGACT TATAAATTCG AGAAGGACAT TAICAAGGCA CTGGAGAACA
301 TTGTGCTCCT CGACGAGAAC AAGAAGAACA AGTCTGATCT TCACGCTACC GCTCTCTCTT
361 TCCGACTTCT TCGACAACAC GGCTTCGAGG TGTCCAGGA CGTCTTCGAG AGATTTAAGG
421 ACAAGGAGGG AGGATTTAAC GCGGAGCTGA AGGGAGACGT TCAGGGTCTT CTCTCCTTGT
481 ACGAGGCGTC CTACCTGGGA TTCGAGGGAG AGAACCTCCT GGAGGAAGCT CGTACATTTT
541 CCATCACTCA CCTTAAGAA AACTTAAAG AGGGAATTAA CACCAAGGTG GCCGAGCAGG
601 TTTCTCAGCG CCTGGAGCTC CCTACCACC AACGGCTCCA TAGACTGGAG GCTCGTTGGT
661 TCCTGGACAA ATATGAGCCA AAGGAGCCTC ATCATCAGTT GCTGTTGGAG TTGGCCAAGC
721 TGGACTTCAA TATGGTTCAG ACGCTGCACC AAAAGGAGTT GCAGGACCTG TCTCGATGGT
781 GGAACGAGAT GGGATTGGCC TCGAAGCTGG ATTTTGTCCG TGACCGACTT ATGGAGGTCT
841 ATTTTTGGGC CCTTGGAAATG GCGCCTGACC CCCAGTTCCG AGAGTGCCGG AAGGCGGTGA
901 CGAAGATGTT CGGTCTTGTG ACTATCATCG ACGACGCTCA CGATGTCTAC GGCACACTCG
961 ACGAGTTGCA GCTGTTCACT GACGCCGTCT AGCGATGGGA TGTGAACGCC ATTAATACTC
1021 TCCCTGACTA TATGAAGCTG TGCTTCCTGG CTCTGTACAA CACTGTCAAC GATACCTCGT
1081 ACTCTATCCT CAAGGAGAAG GGACACAACA ATCTCTCTTA CTTGACCAA TCCTGGGAG
1141 AACTGTGCAA GGCTTTTCTG CAGGAGGCTA AAIGGTCCAA TAACAAGATC ATTCCTGCTT
1201 TTTCTAAATA CCTGGAAAAT GCCTCGGTGT CGAGCTCTGG CGTCCGCCCT CTGGCCCTTT
1261 CTTACTTCTC CGTCTGOCAG CAGCAGGAGG ATATTTCCGA TCATGCTCTT AGATCGCTGA
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1381 CGACCTCTGC TGCTGAGCTG GAACGAGGCG AGACTACAAA TTCCATTATT TCTTACATGC
1441 ACGAAAACGA TGGAACTCT GAAGAACAGG CTAGAGAGGA ACTGCGAAAG TTGATCGACG
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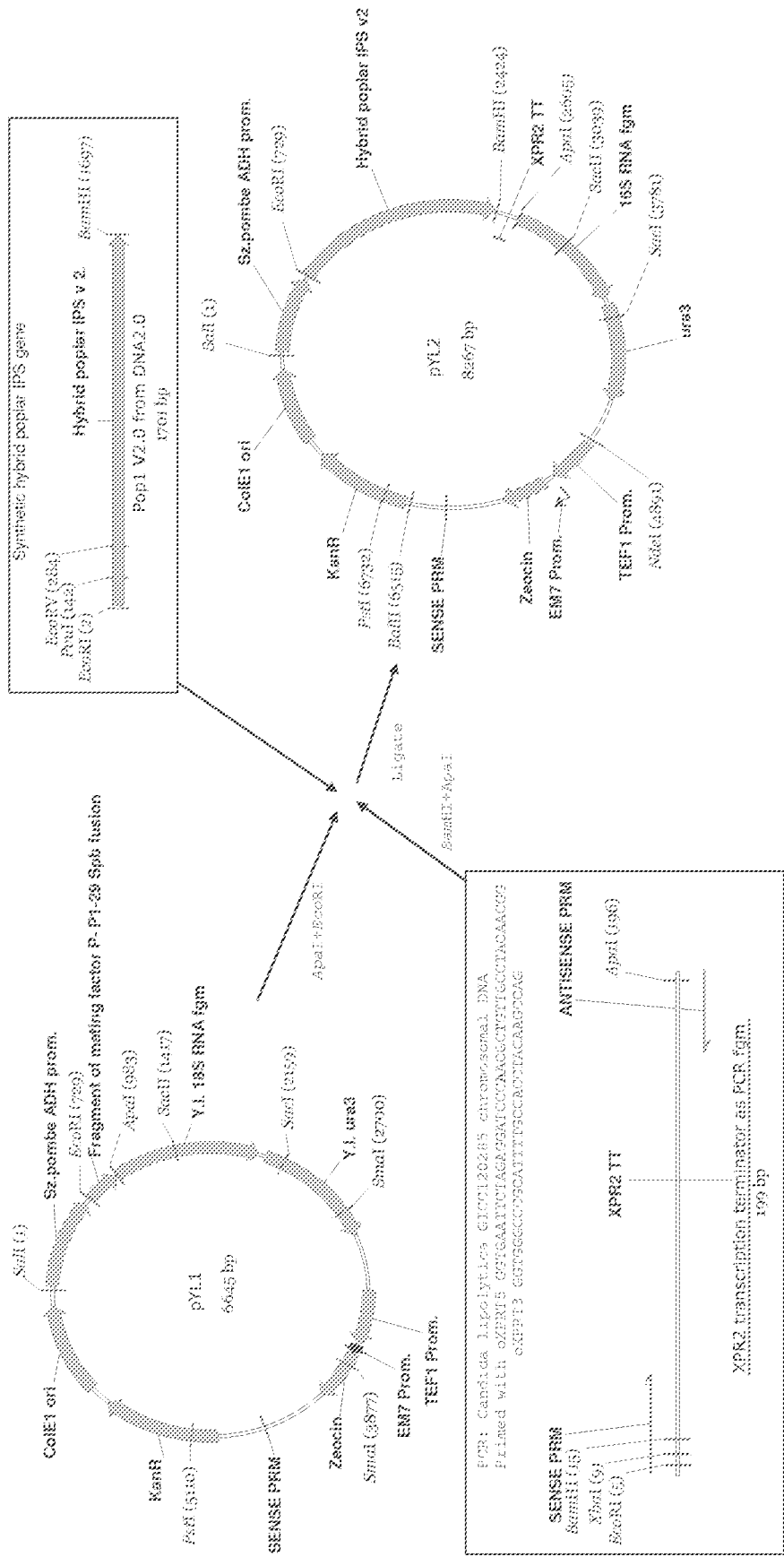
(SEQ ID NO:12)

Figure 17

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241  CAACGTTCAA CGACTTGGTC TTGGTACCG TTTCGAATCC GATATCCGAC GTGCAITGGA
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(SEQ ID NO:13)

Figure 18A2



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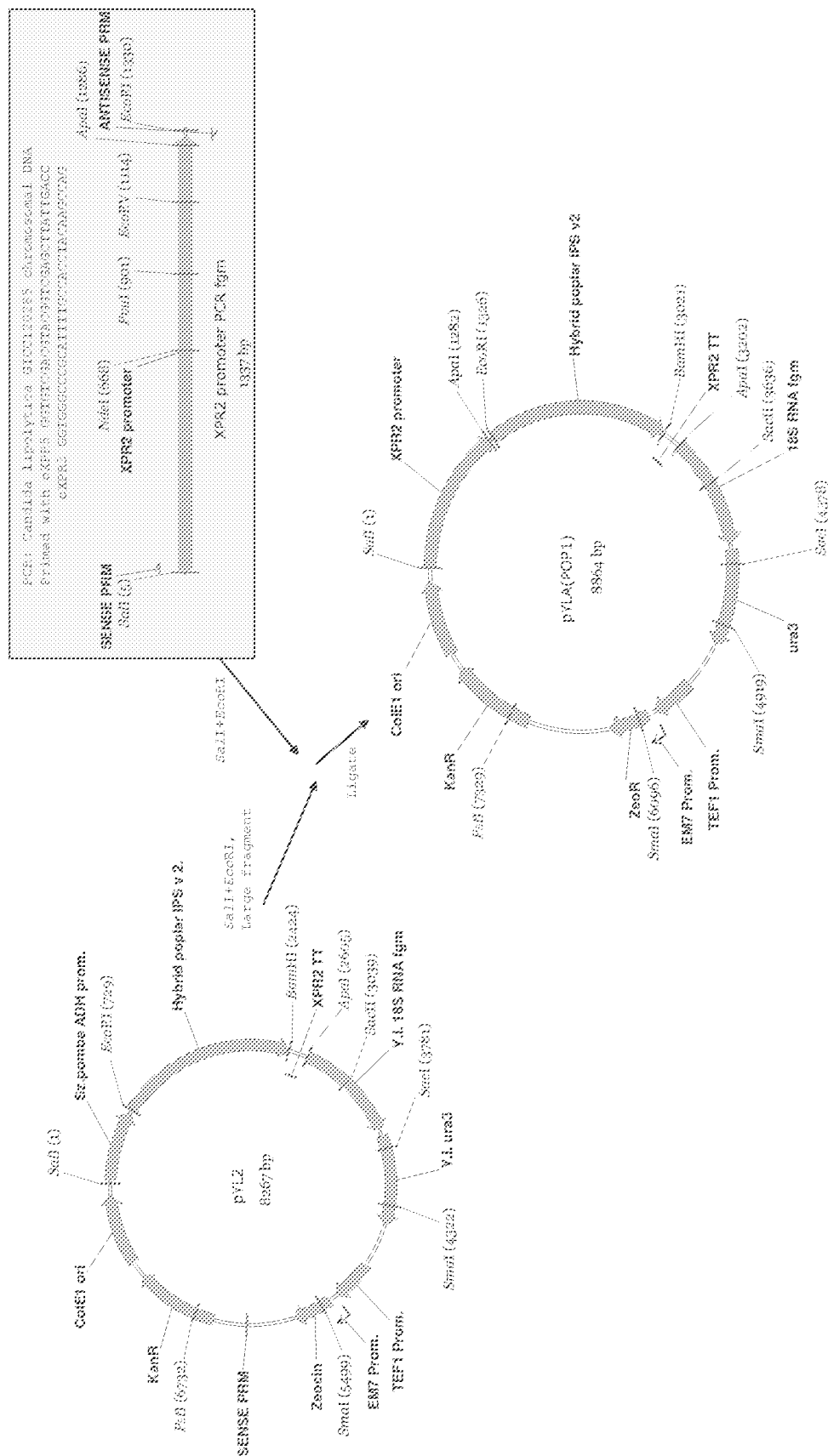


Figure 18C

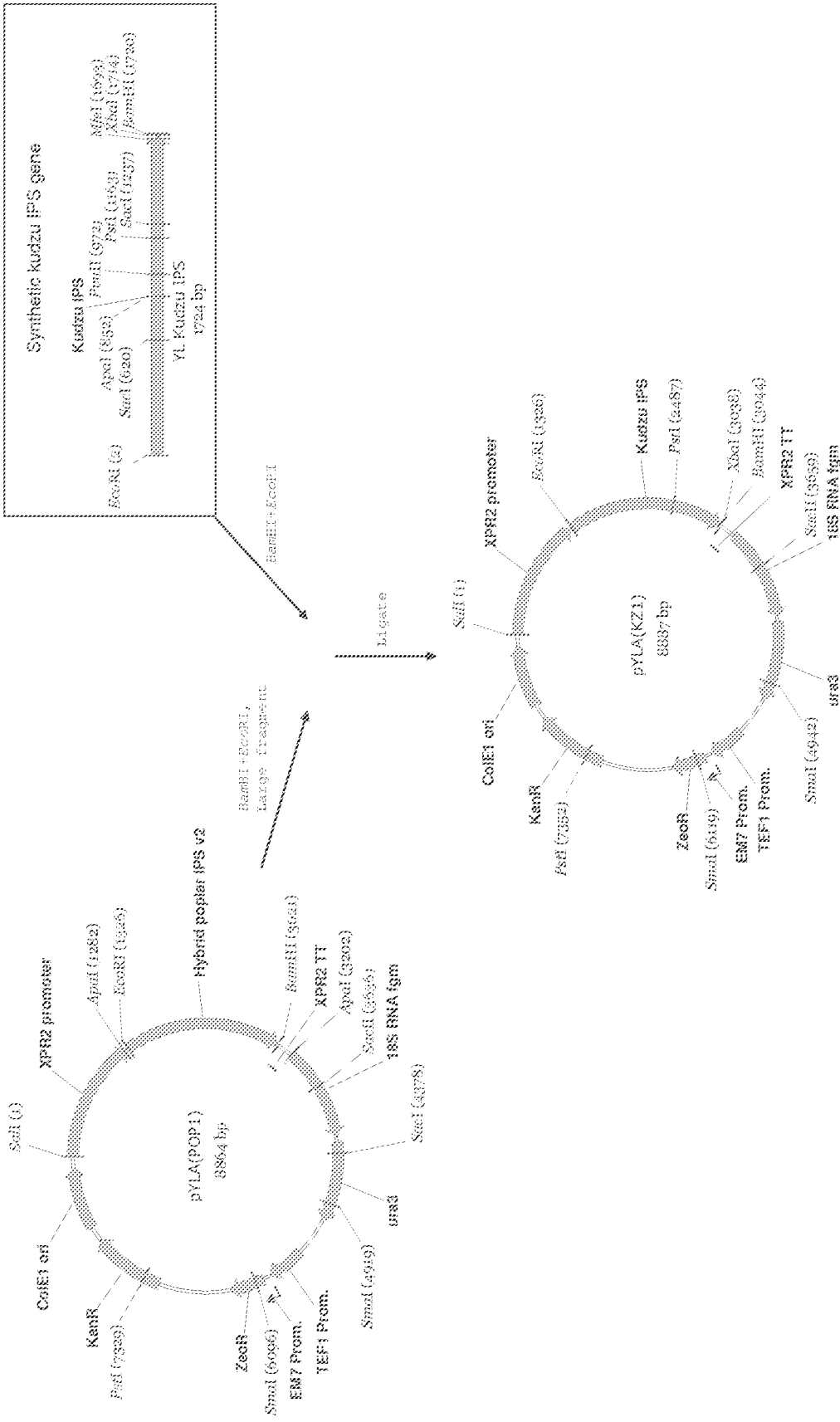


Figure 18D

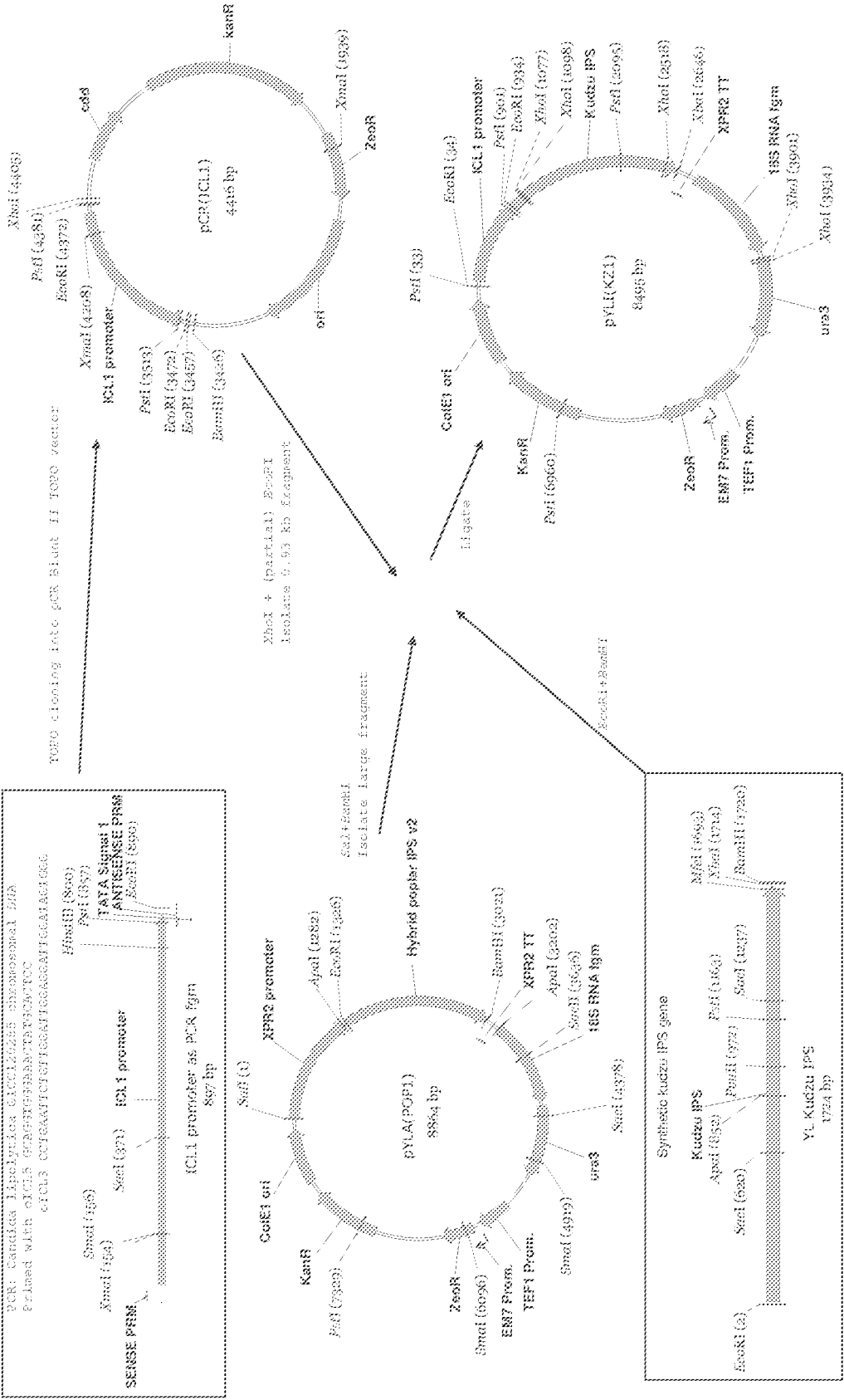


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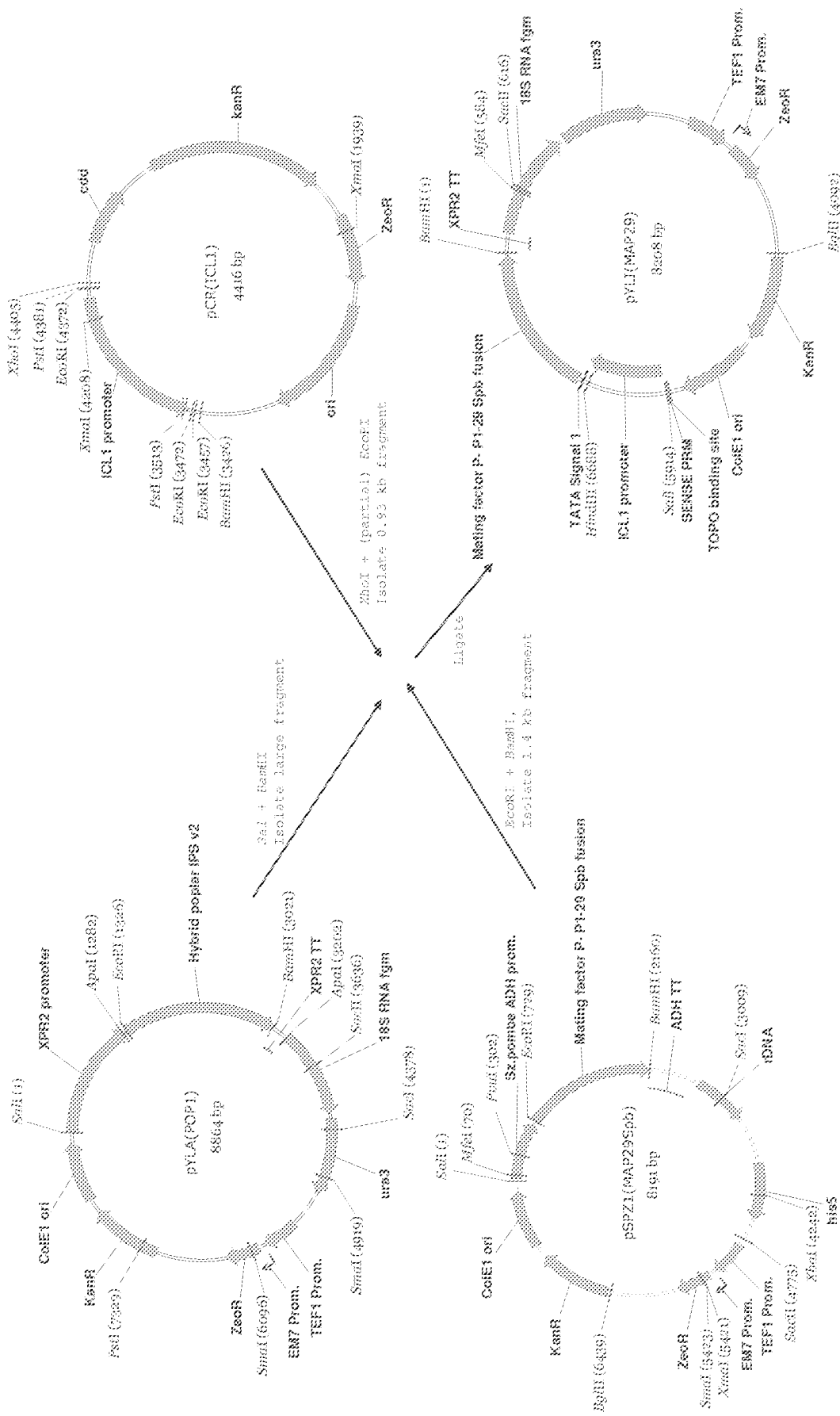


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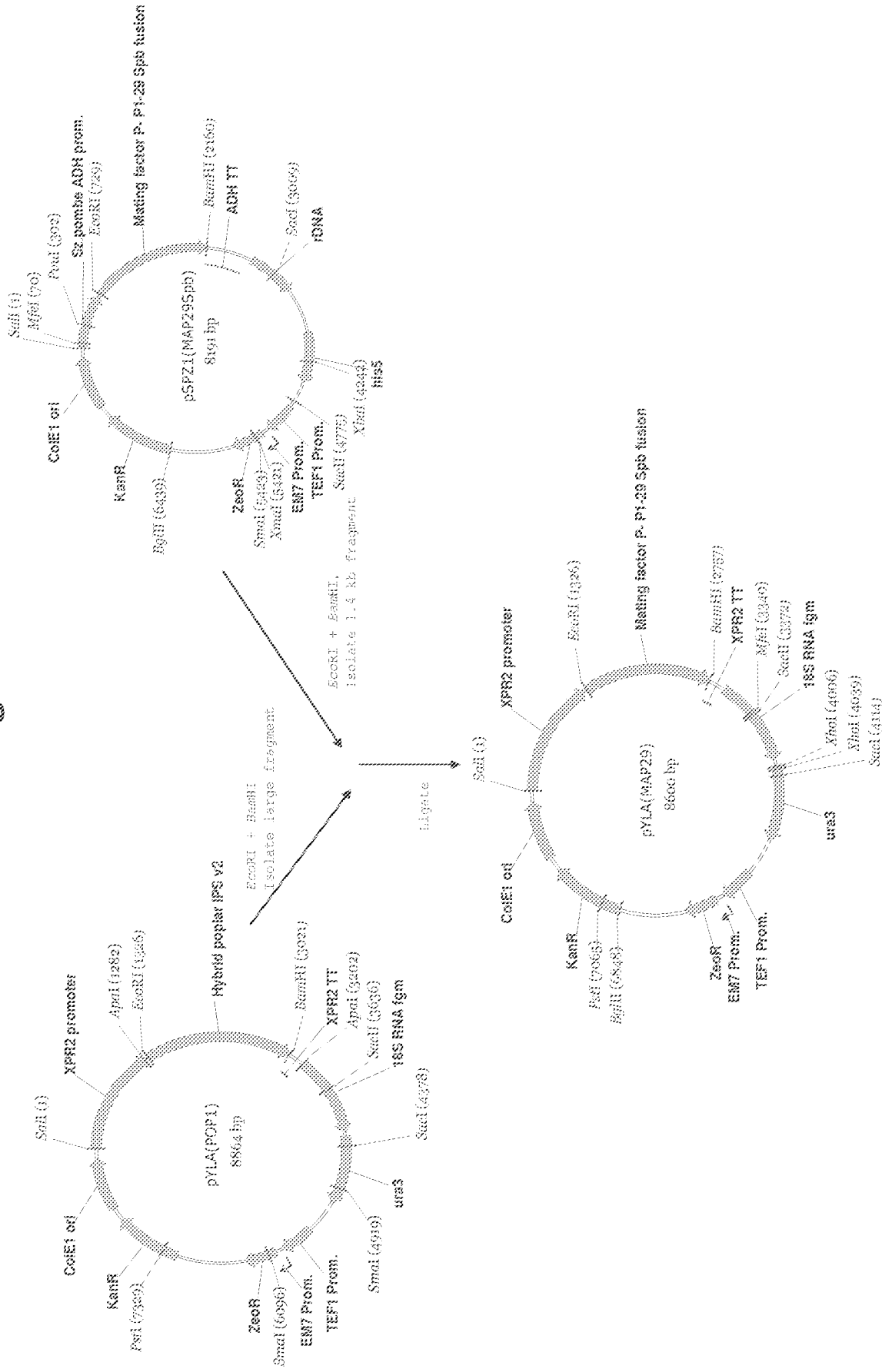


Figure 19A

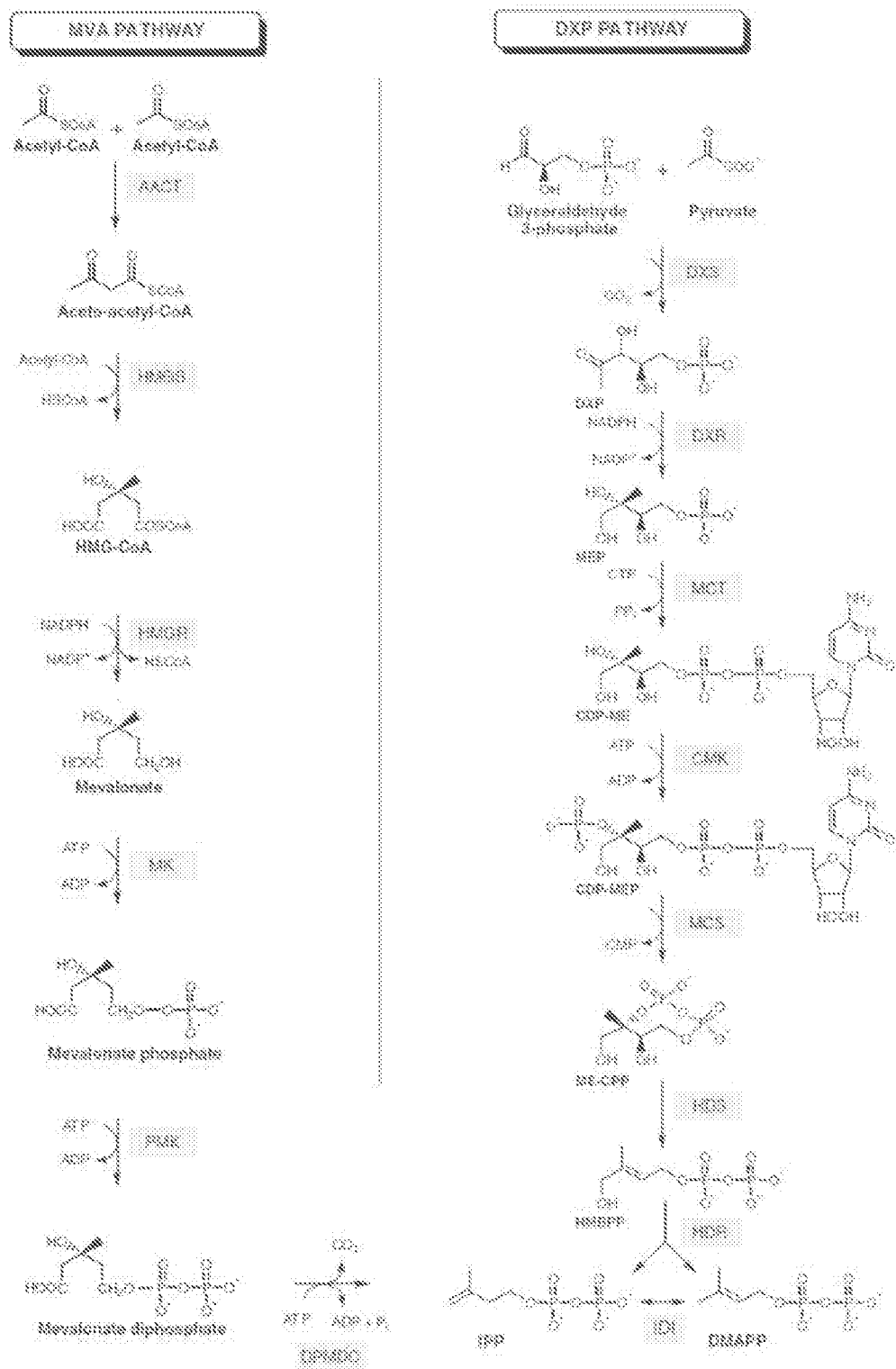


Figure 19B

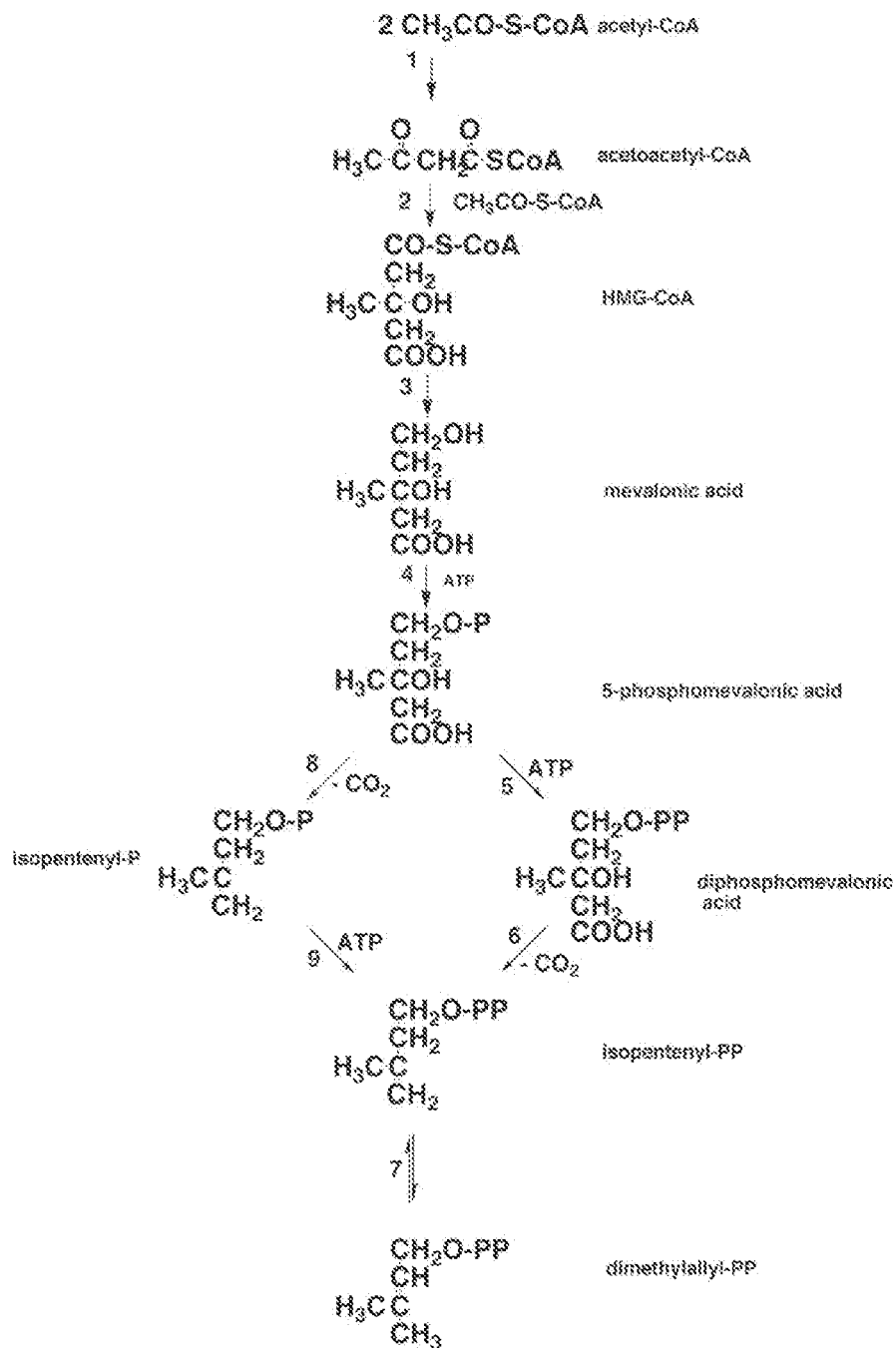


Figure 20

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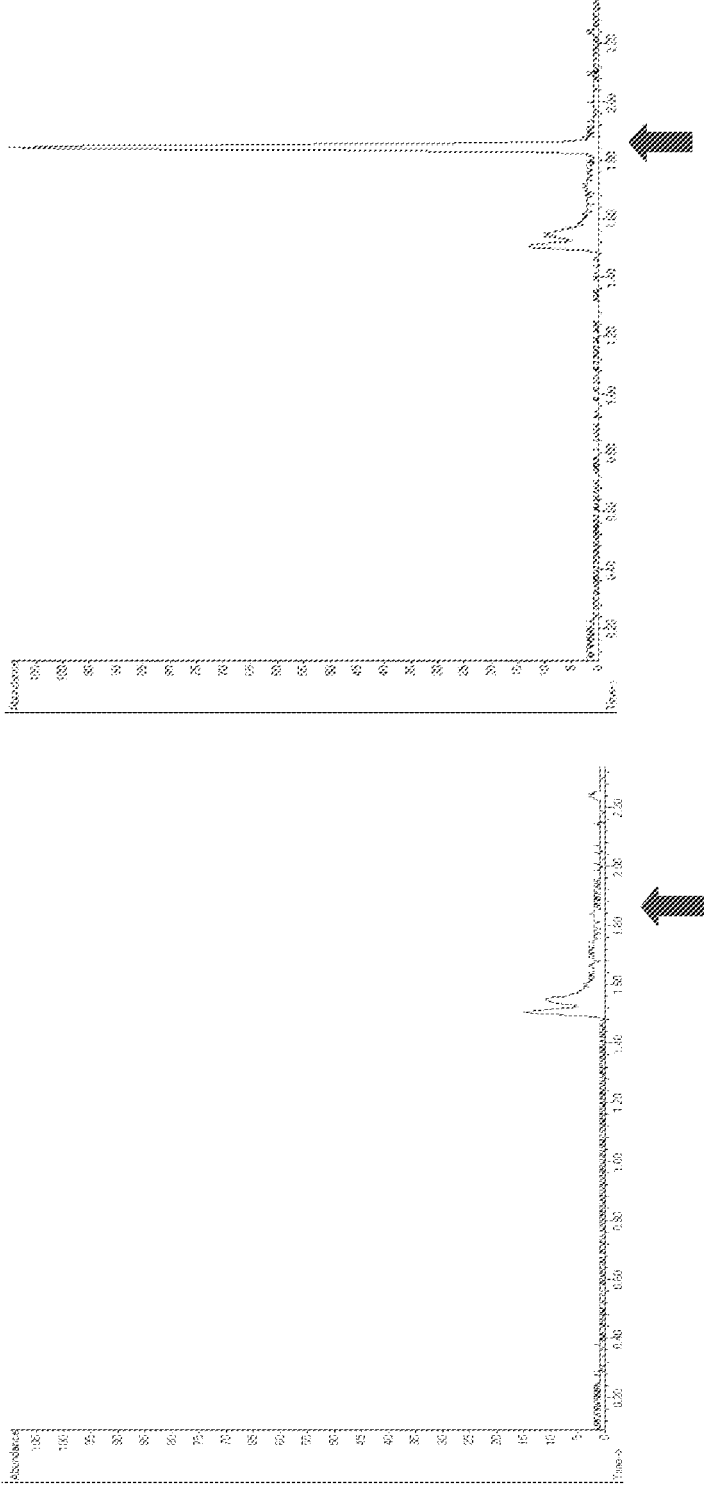


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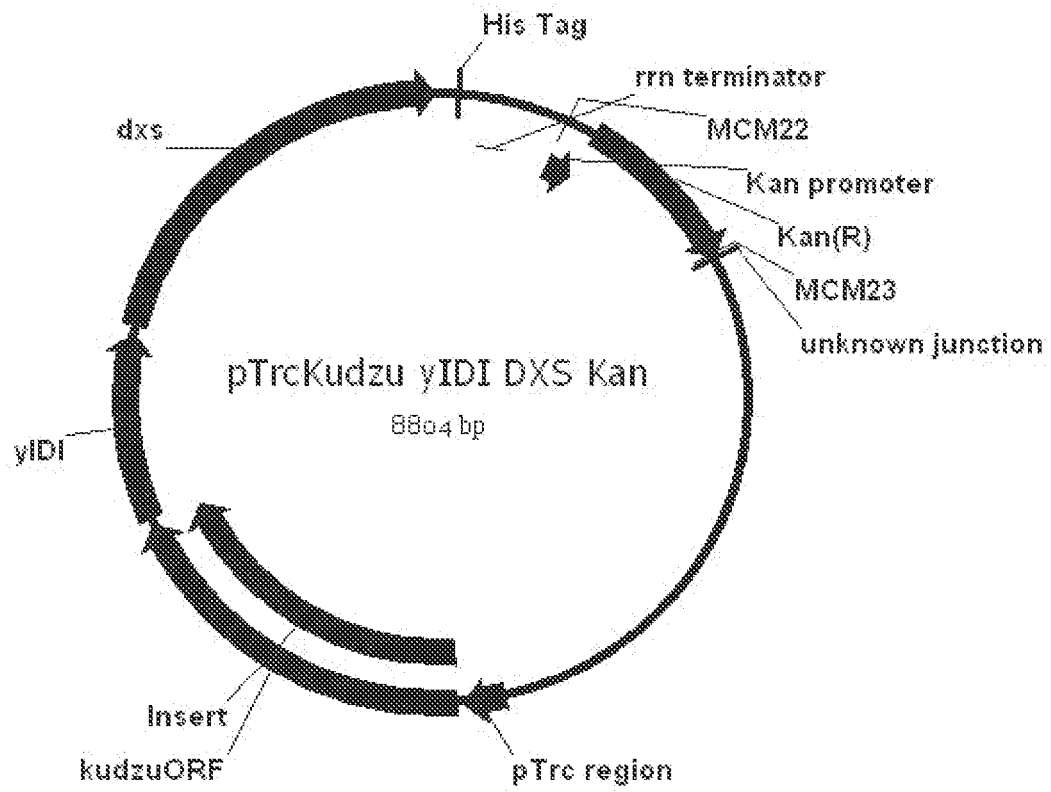


Figure 22A

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Figure 22B

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Figure 22C

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Figure 22D

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Figure 23A

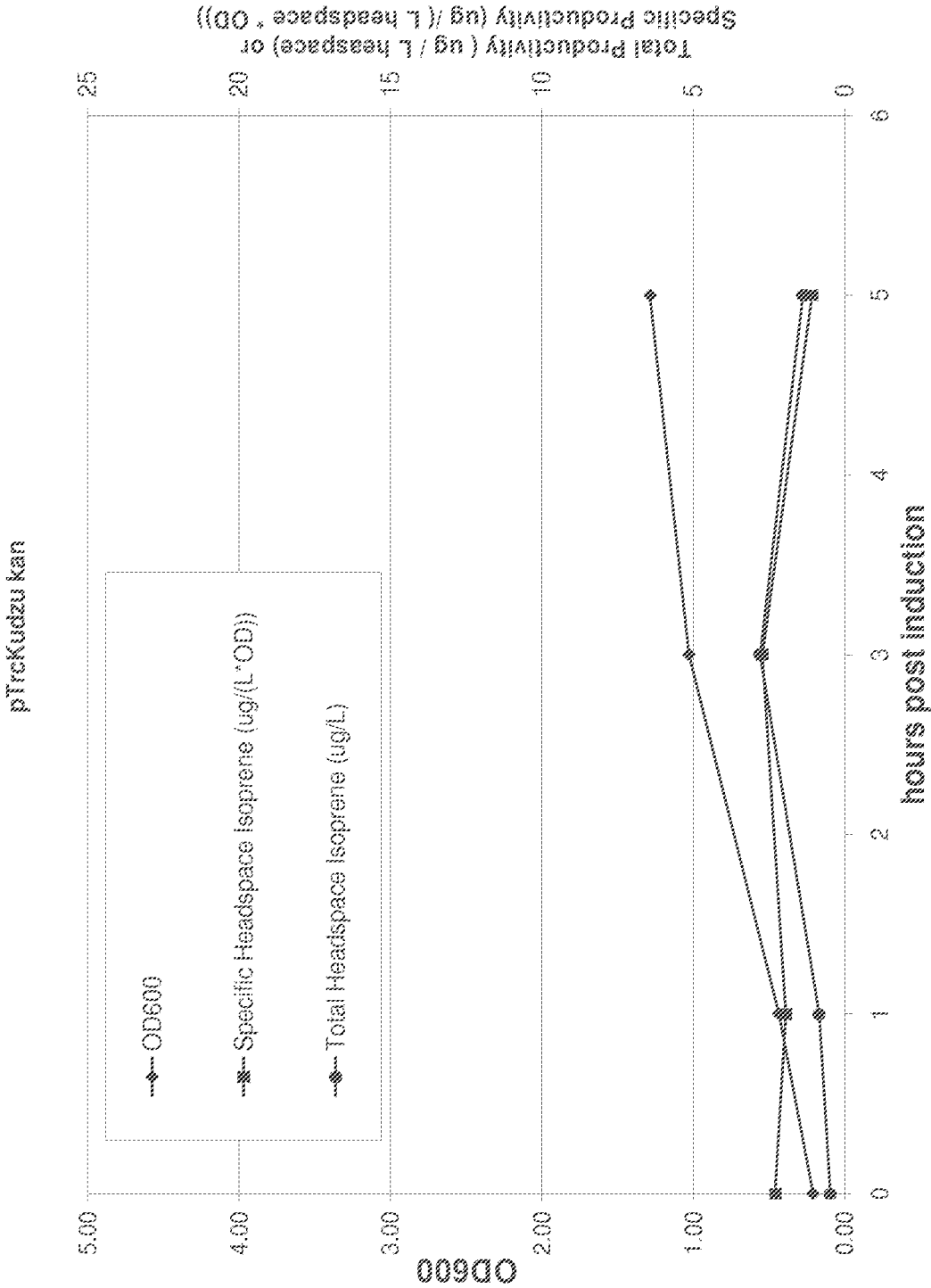


Figure 23B

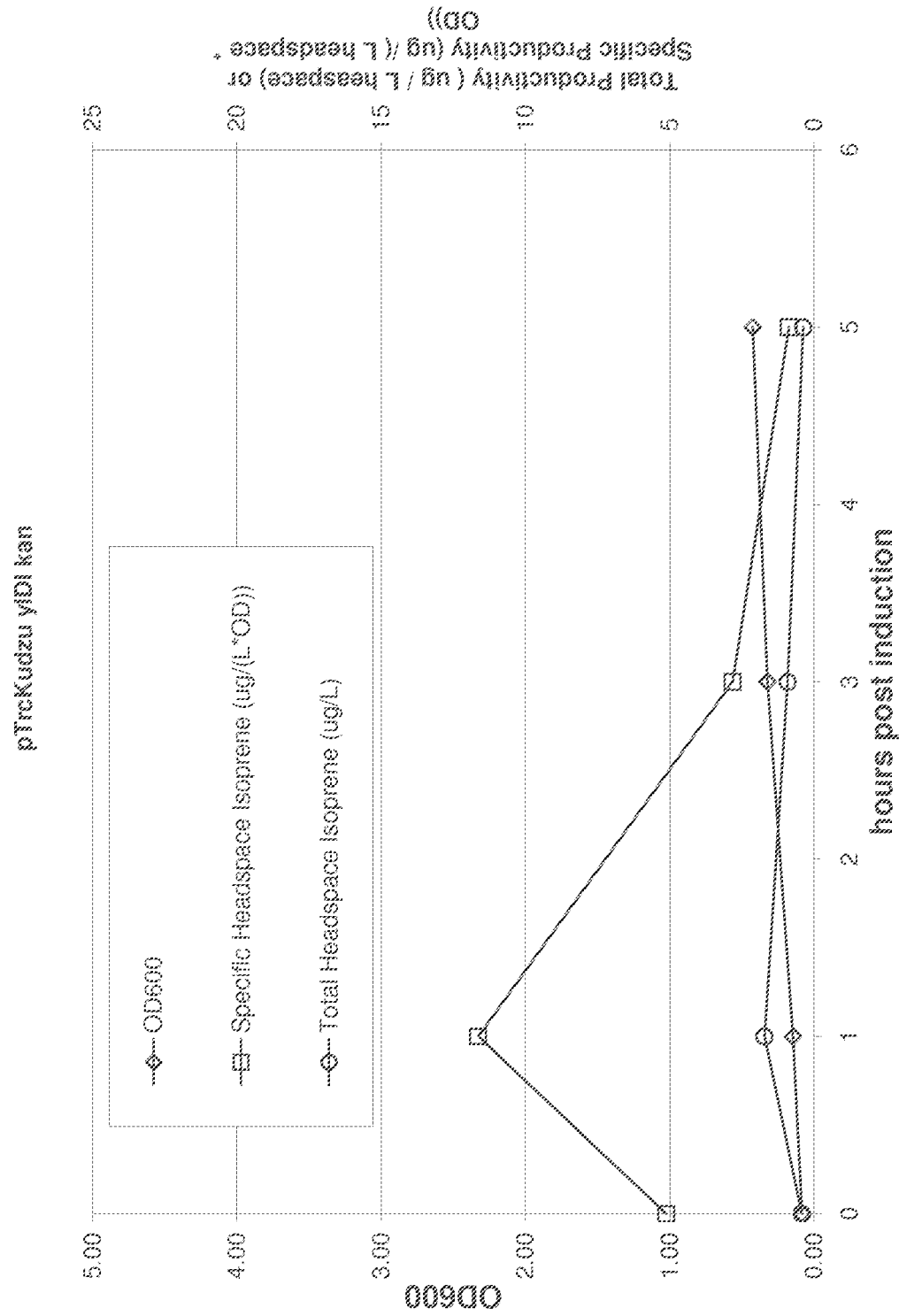


Figure 23C

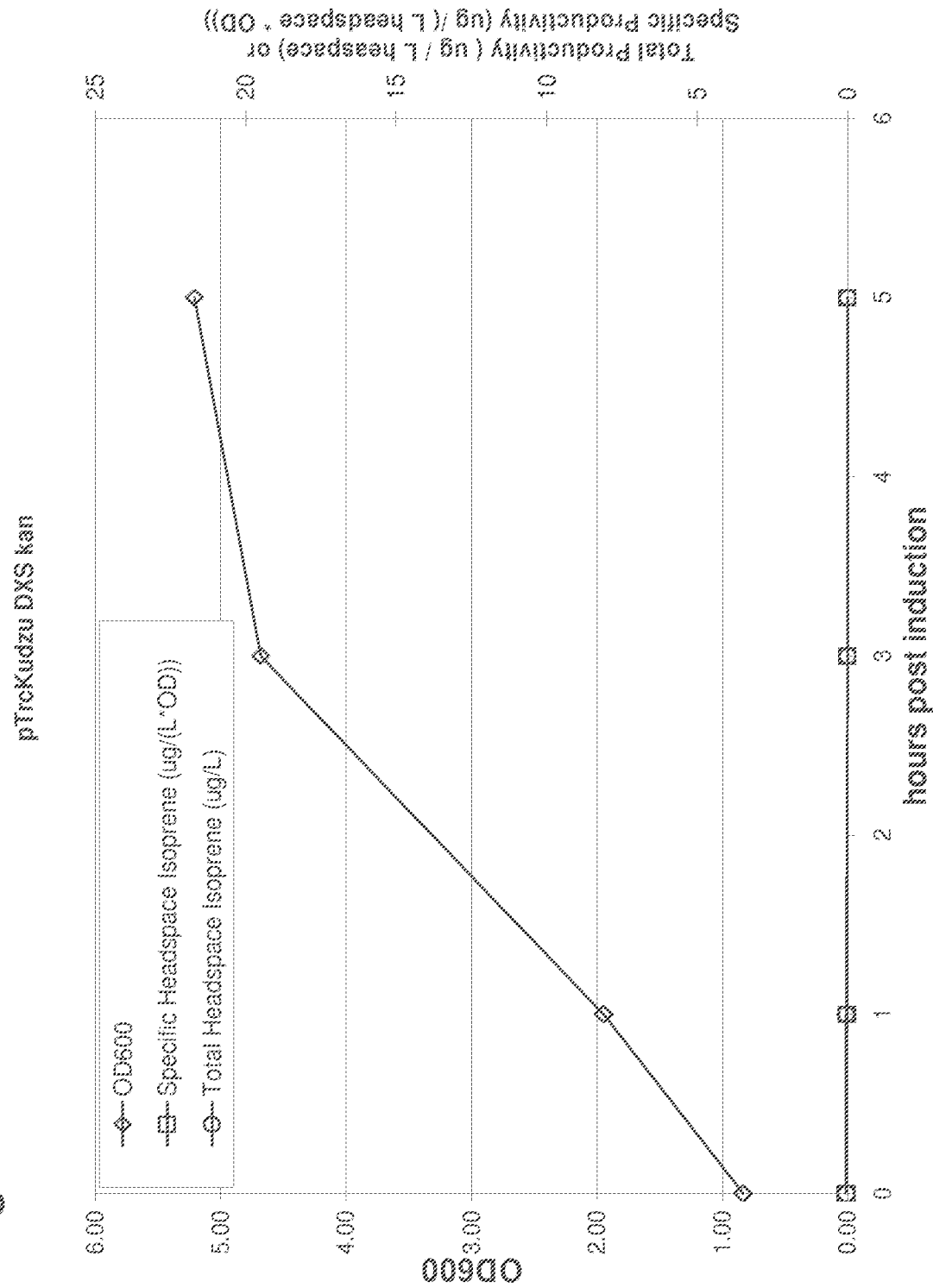


Figure 23D

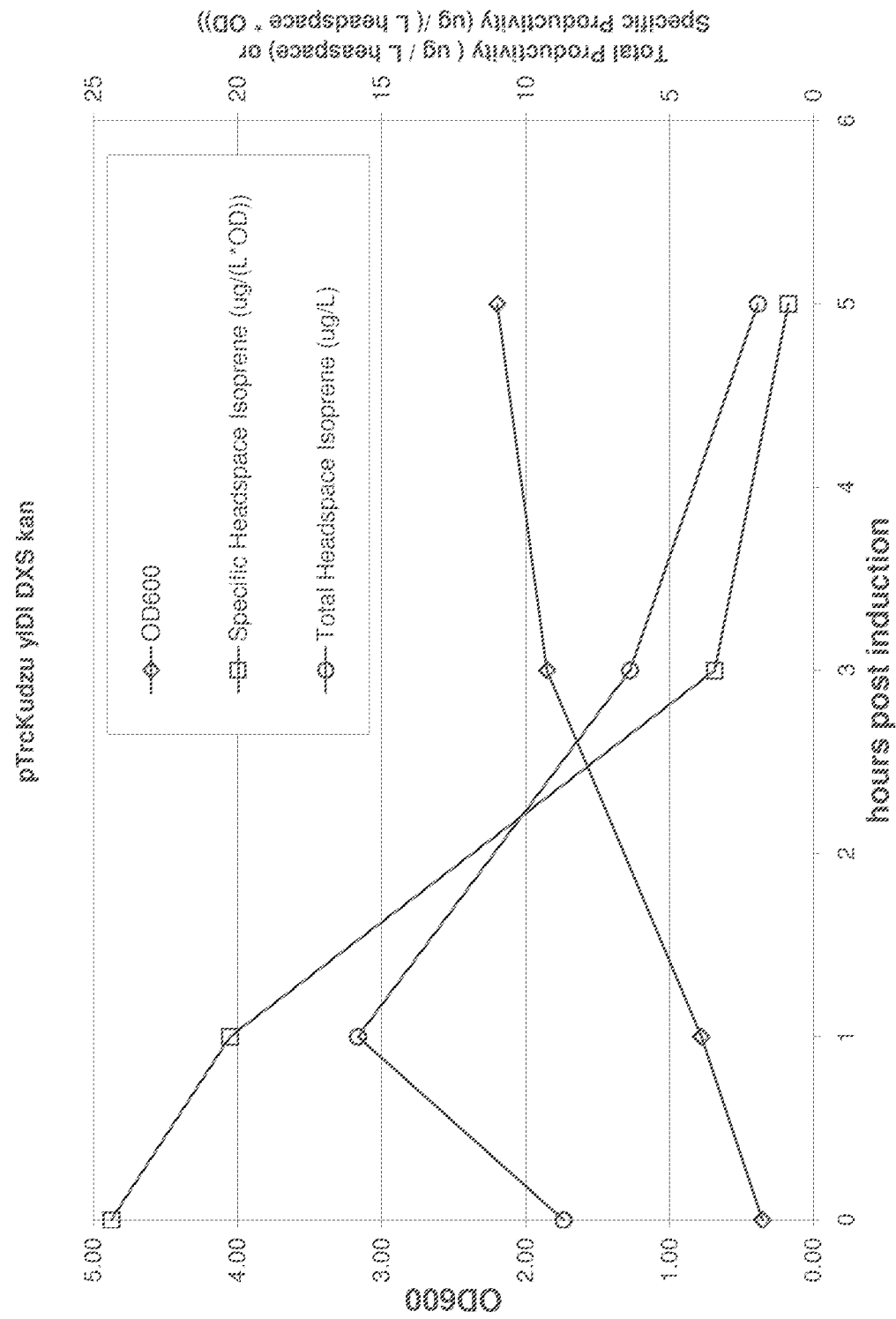


Figure 23E

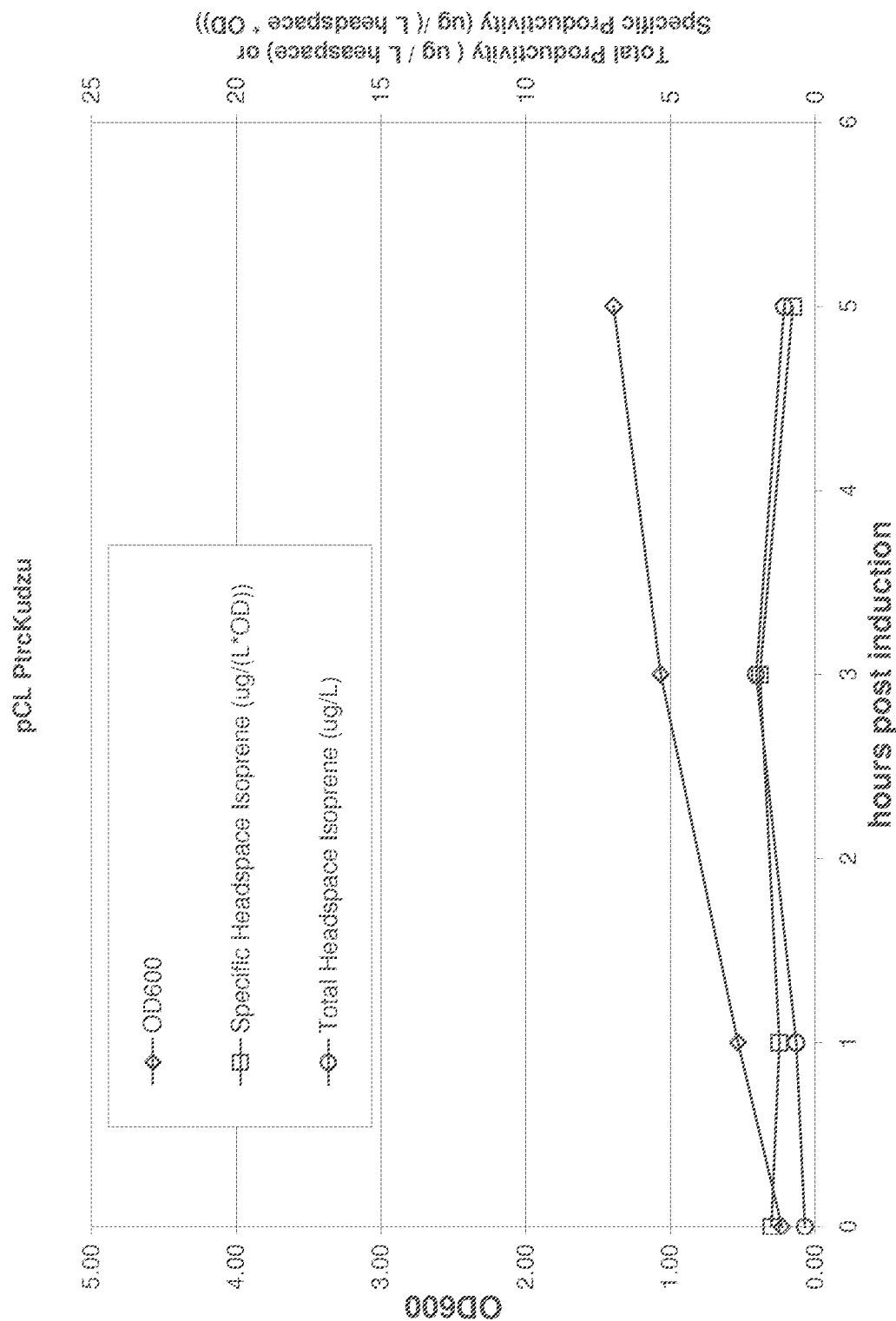


Figure 23F

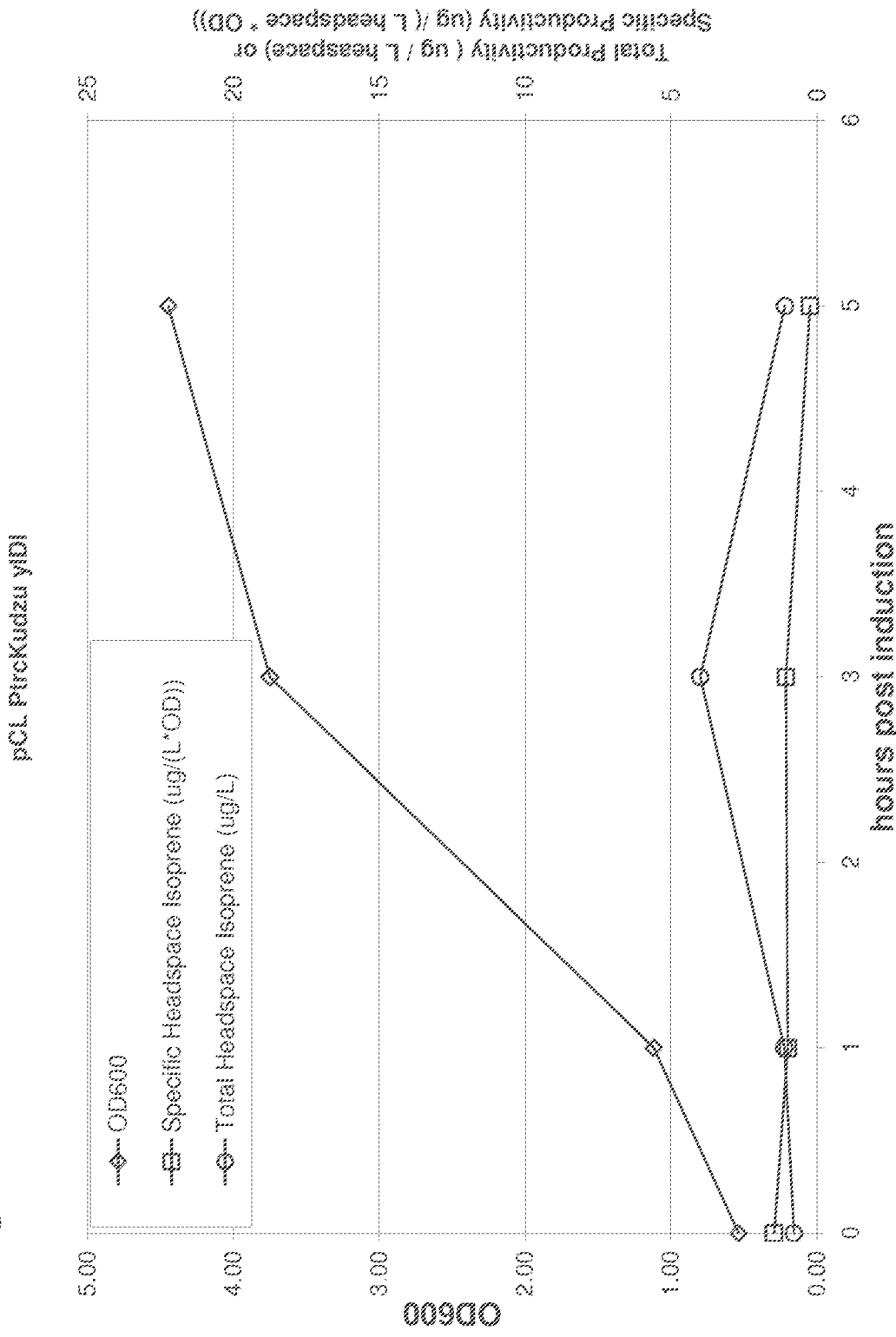


Figure 23G

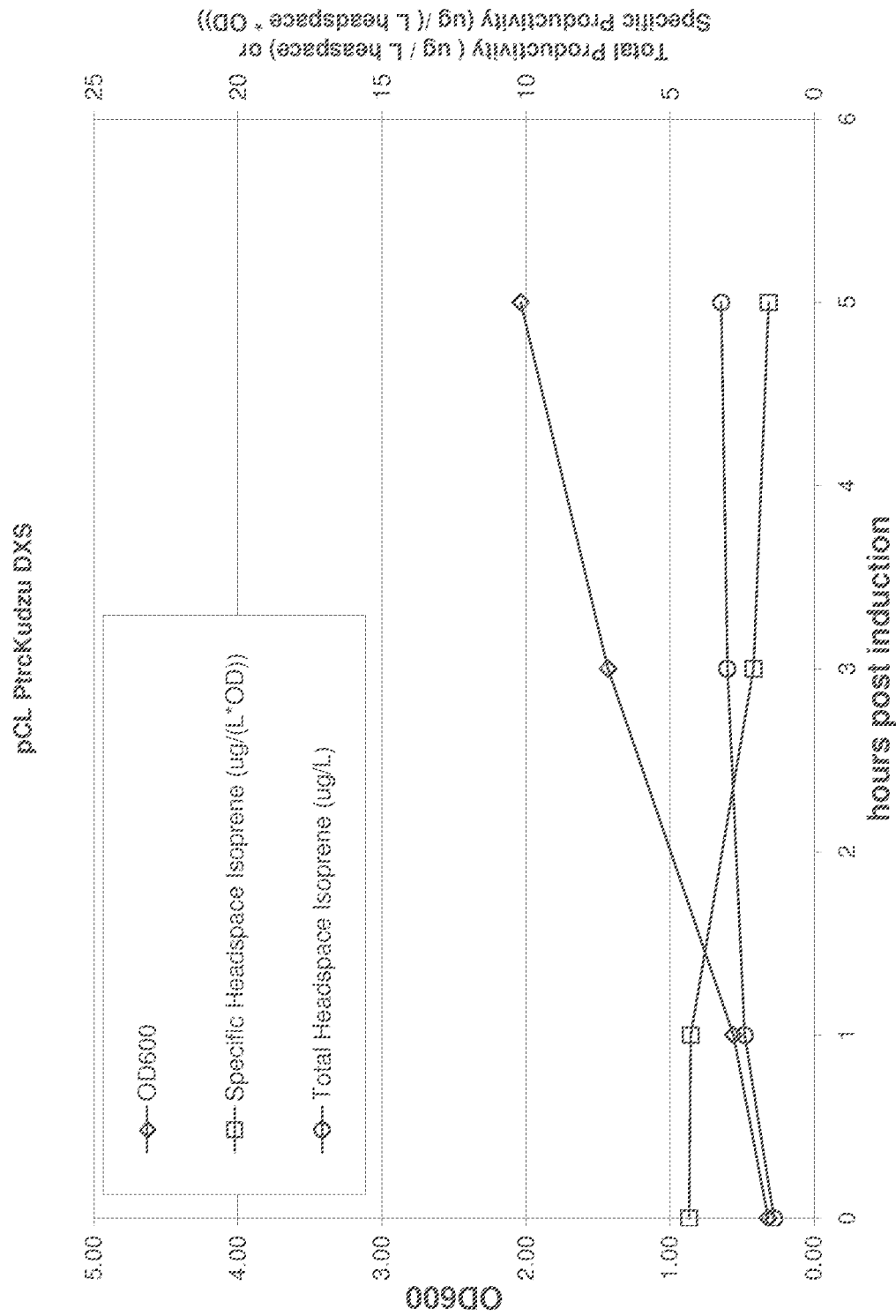


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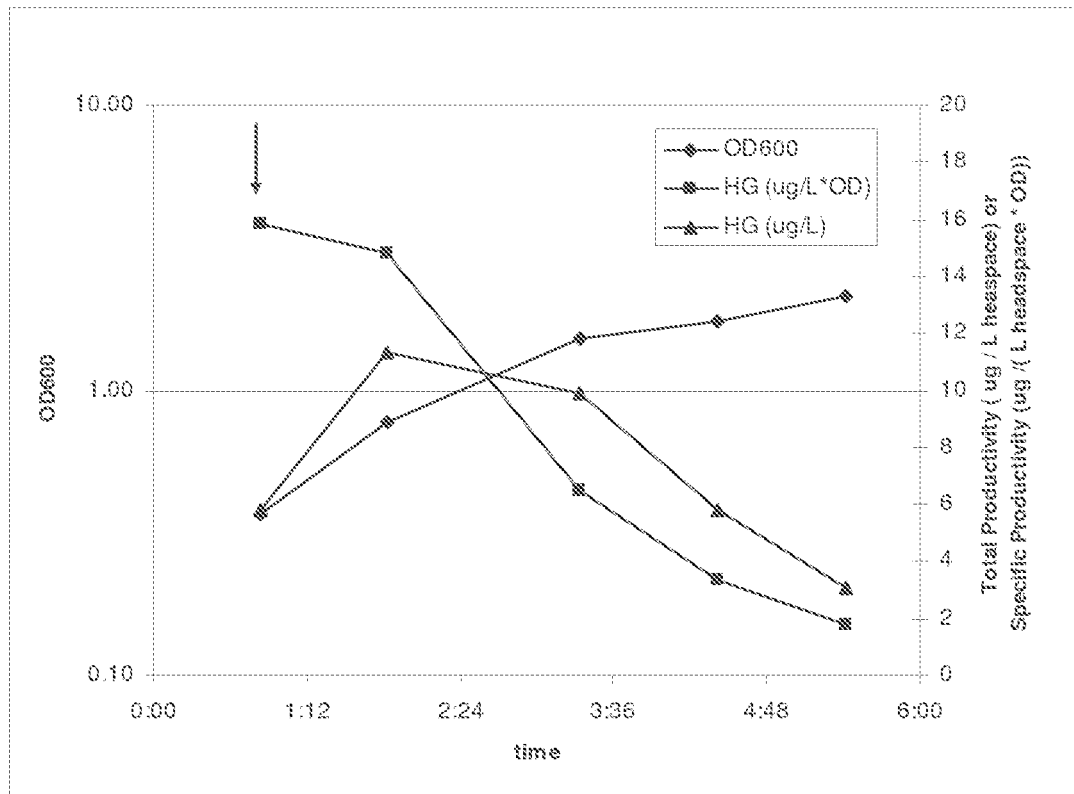


Figure 24

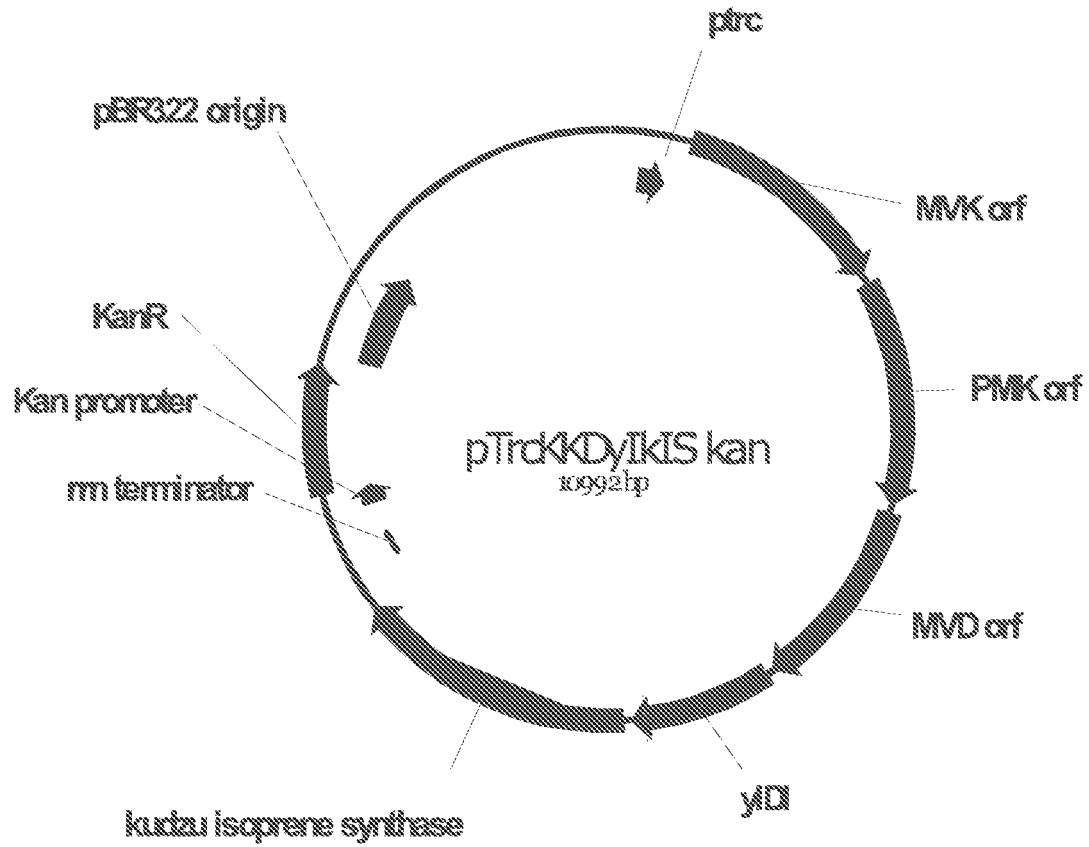


Figure 25A

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Figure 25B

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Figure 25C

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Figure 25D

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(SEQ ID NO:33)

Figure 26

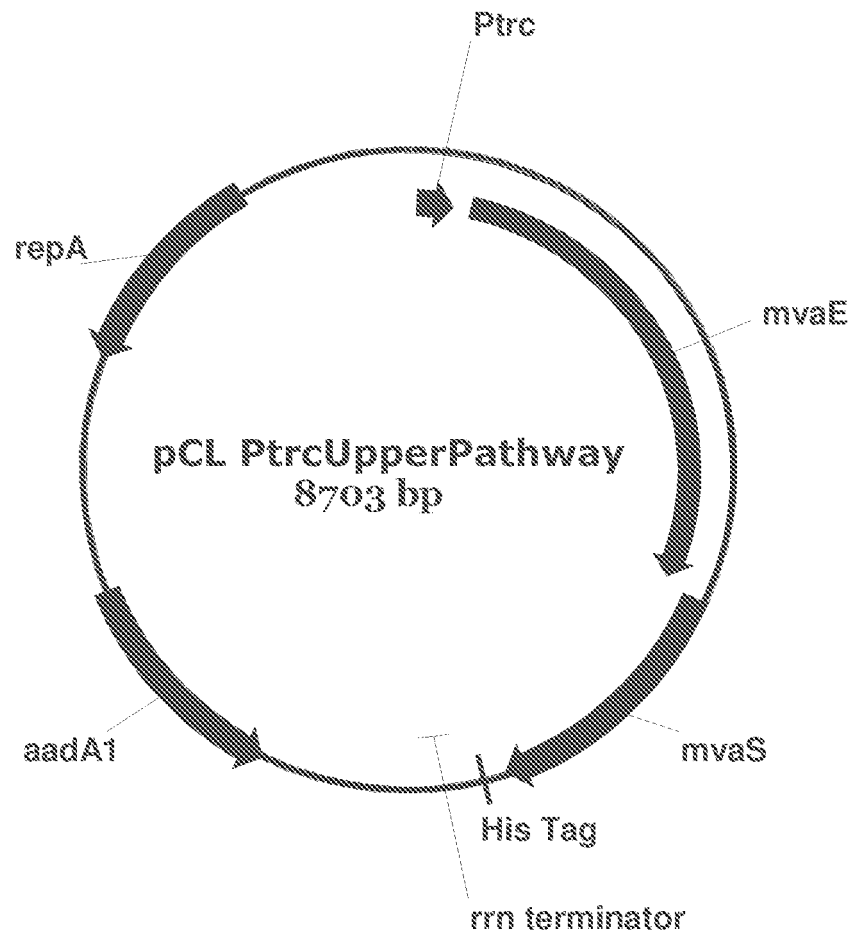


Figure 27A

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Figure 27B

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Figure 27C

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Figure 27D

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Figure 28

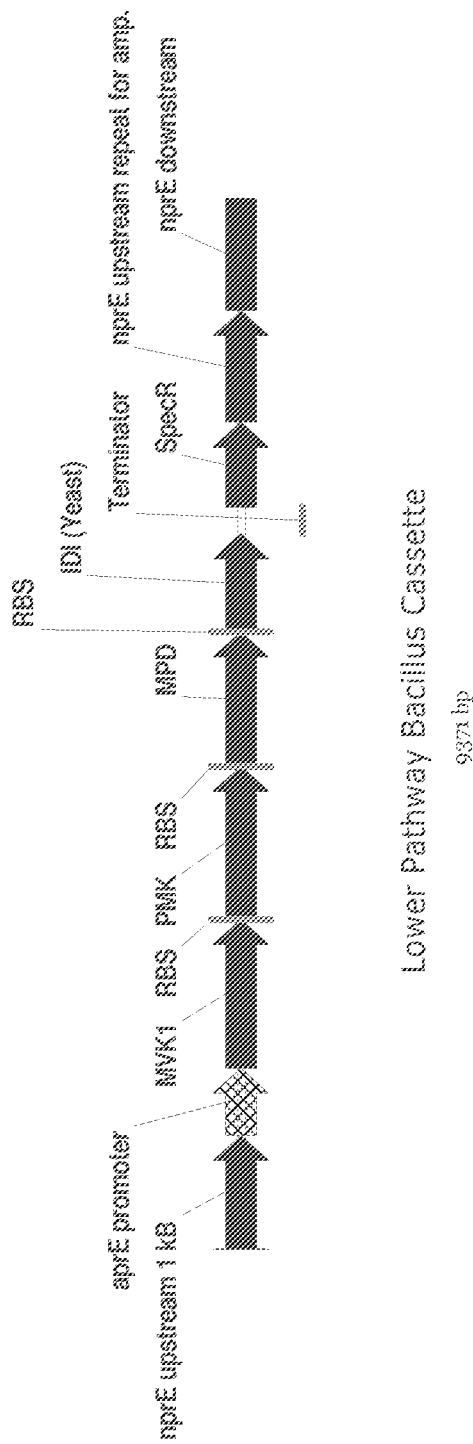


Figure 29A

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Figure 29B

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Figure 29C

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Figure 29D

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Figure 30

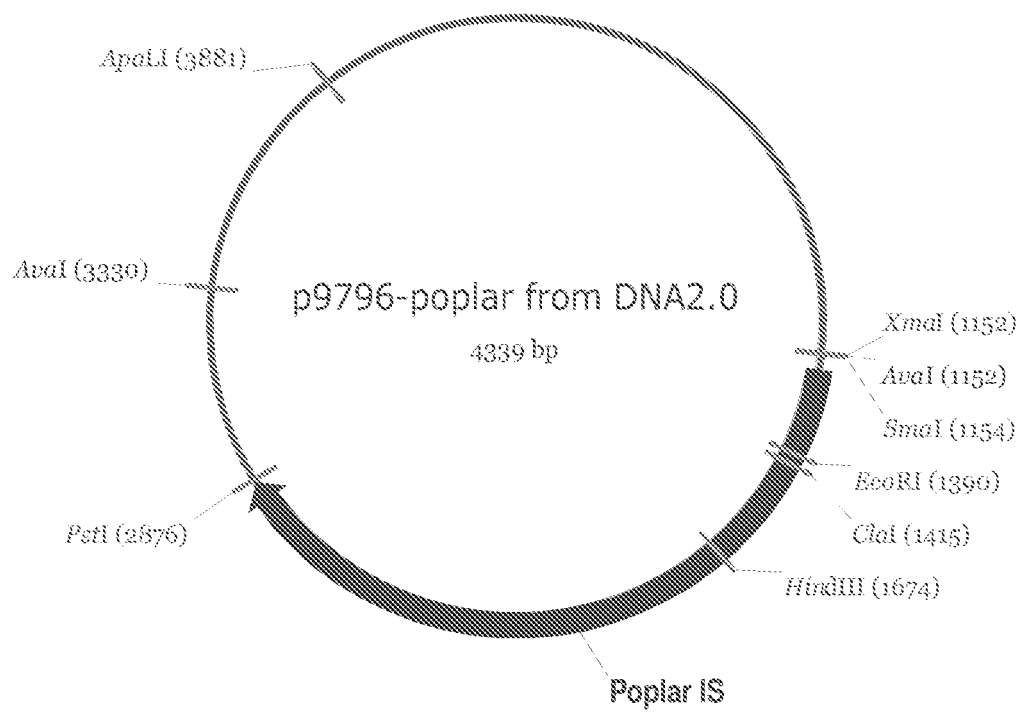


Figure 31A

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Figure 31B

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Figure 32

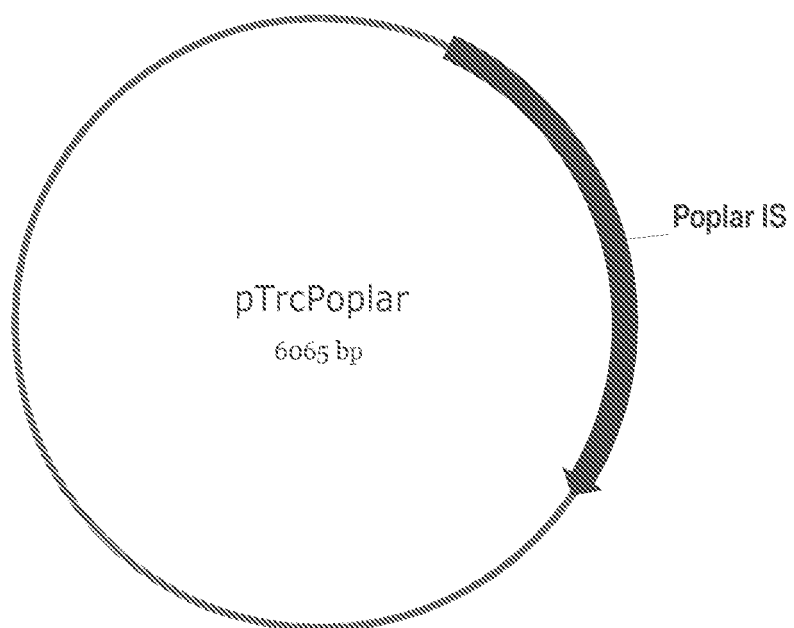


Figure 33A

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Figure 33B

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Figure 33C

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Figure 34

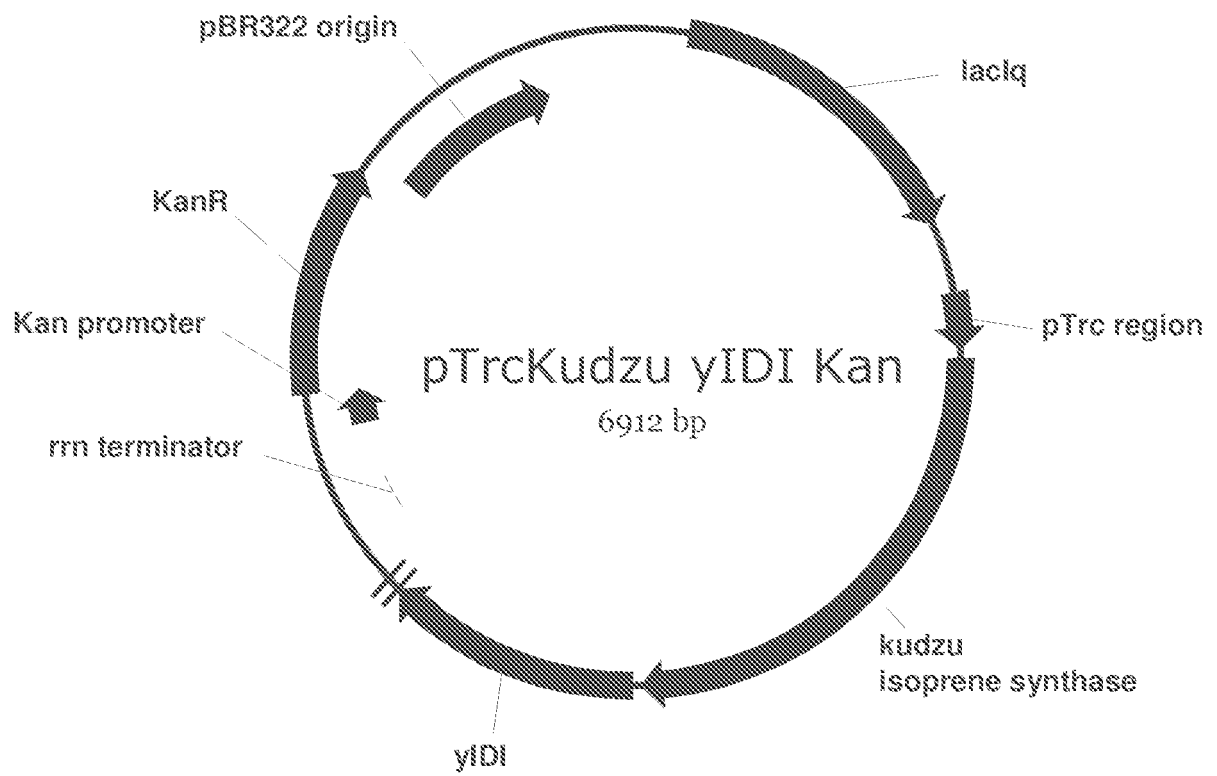


Figure 35A

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Figure 35B

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Figure 35C

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Figure 36

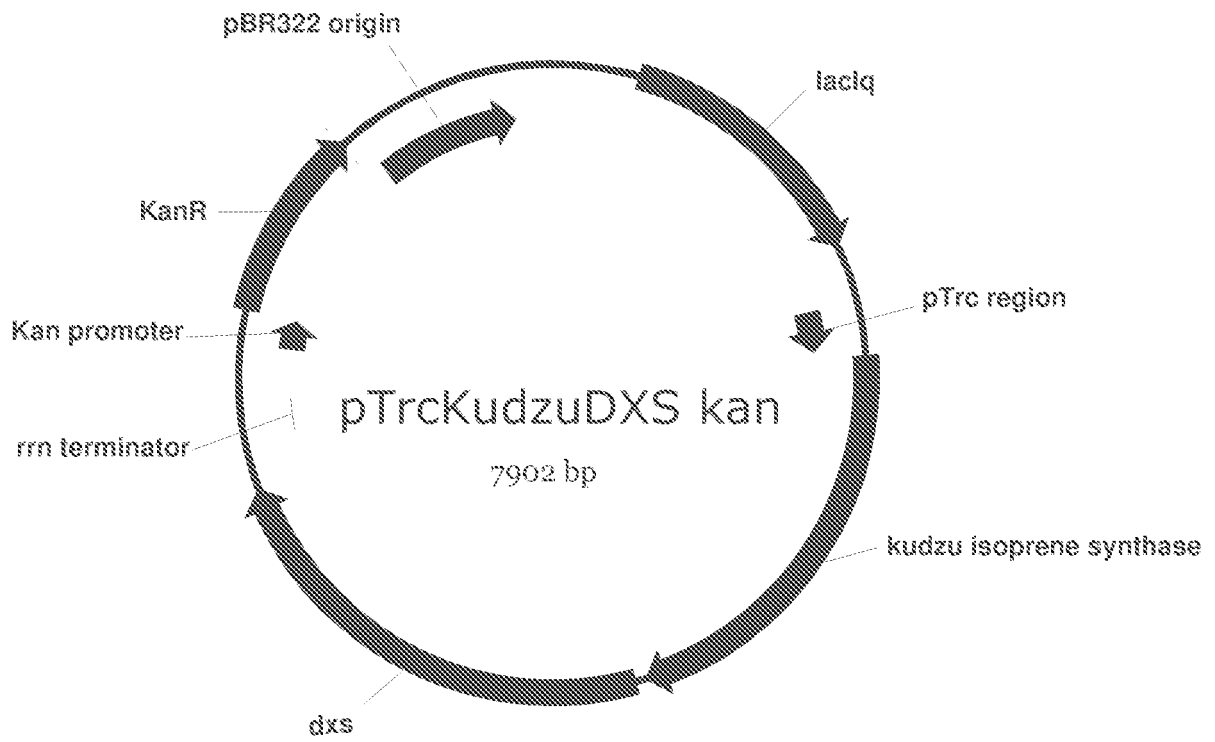


Figure 37A

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Figure 37B

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Figure 37C

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Figure 38

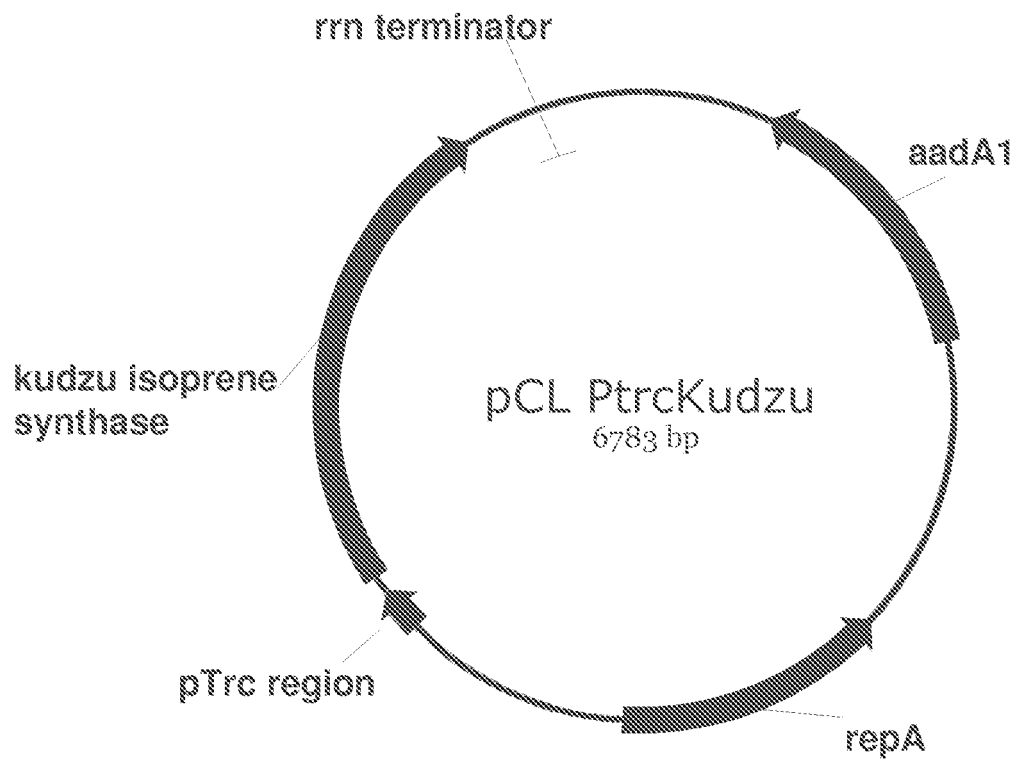


Figure 39A

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Figure 39B

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Figure 39C

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Figure 40

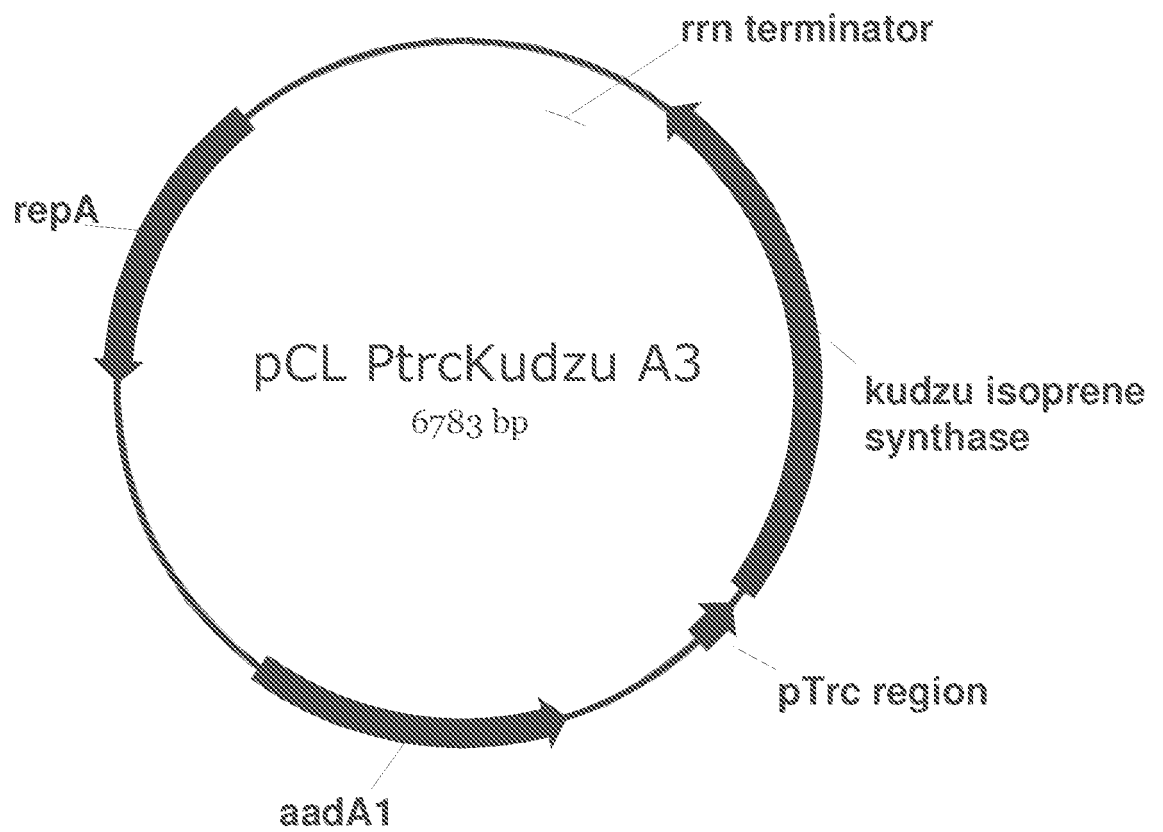


Figure 41A

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Figure 41B

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Figure 41C

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Figure 42

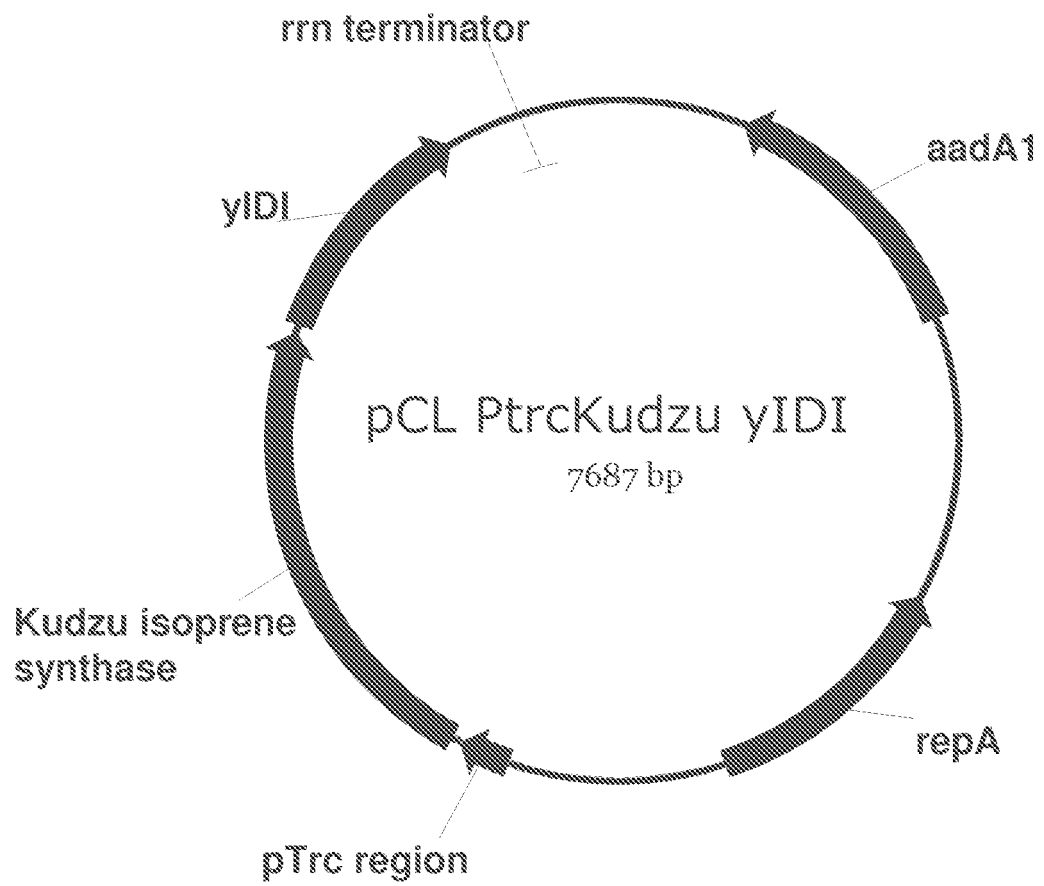


Figure 43A

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Figure 43B

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Figure 43C

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Figure 44

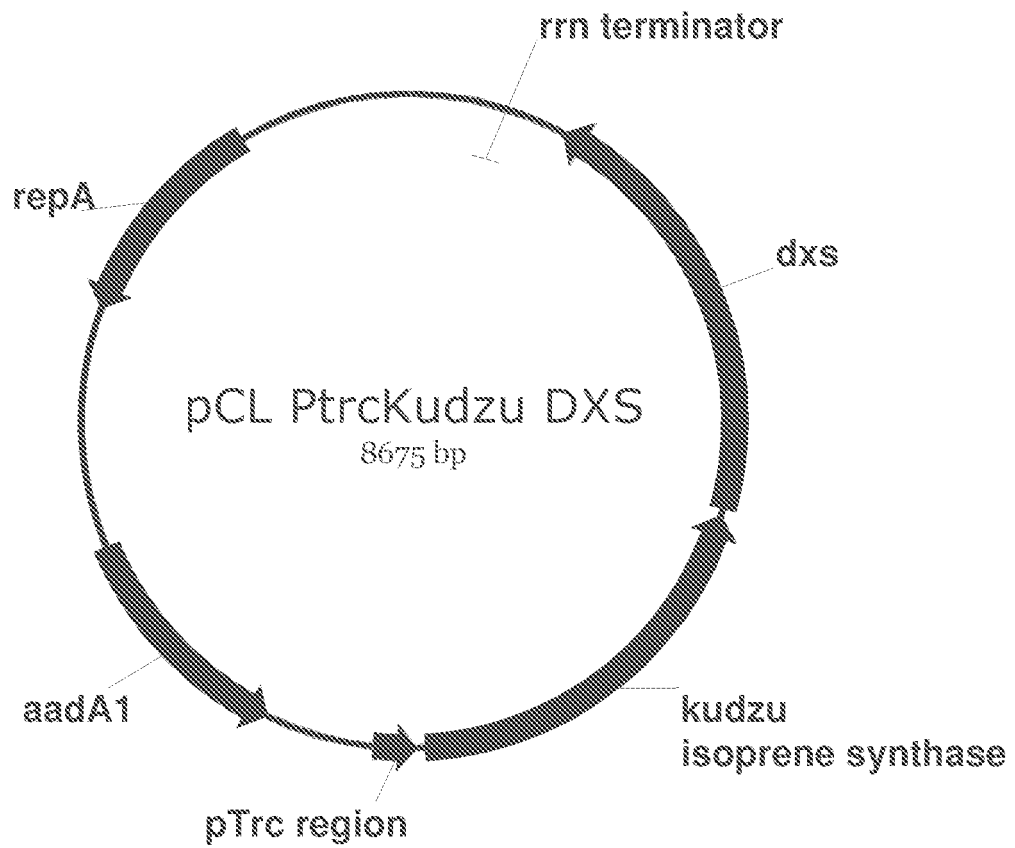


Figure 45A

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Figure 45B

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Figure 45C

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Figure 45D

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Figure 46A

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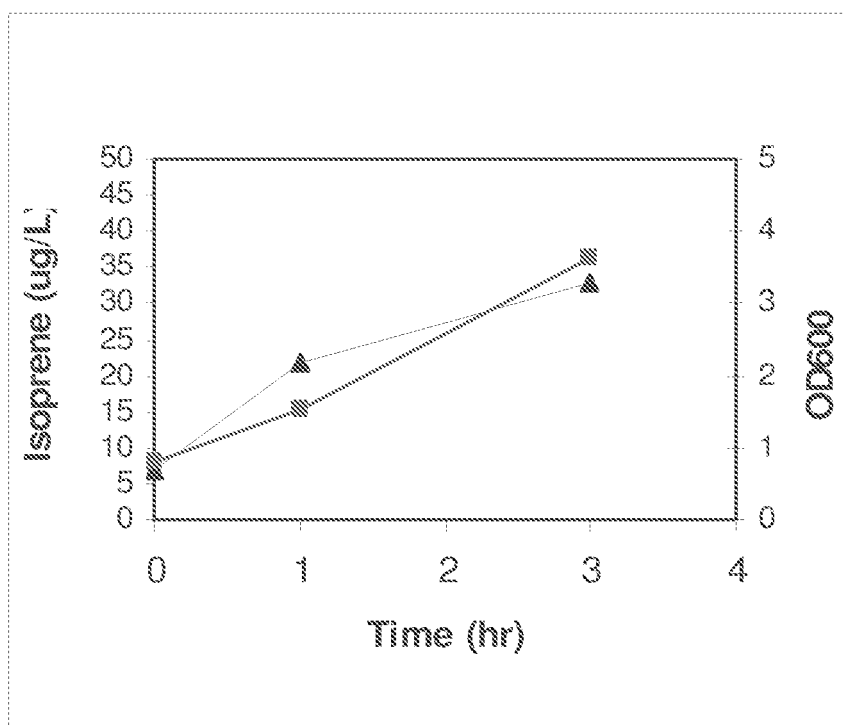


Figure 46B

B.

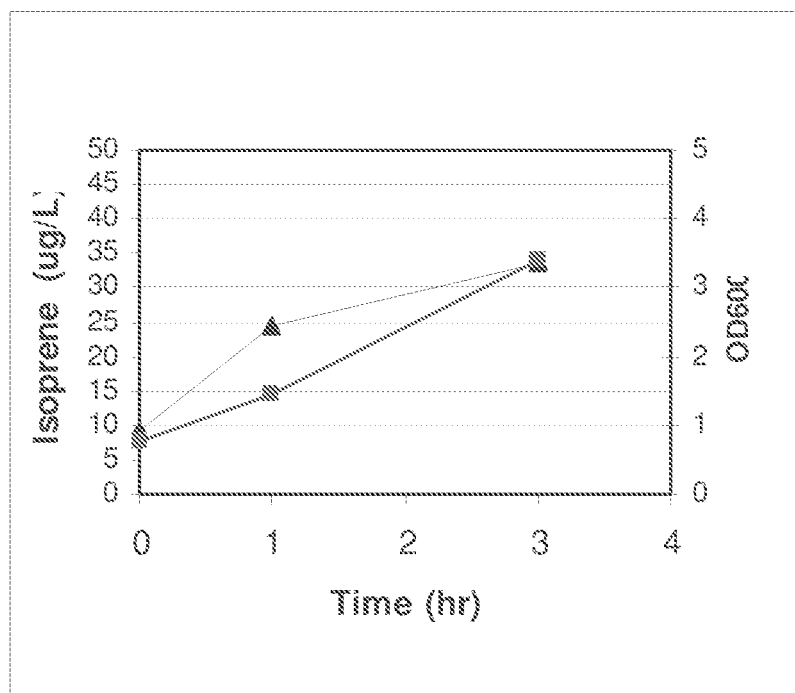


Figure 46C

C.

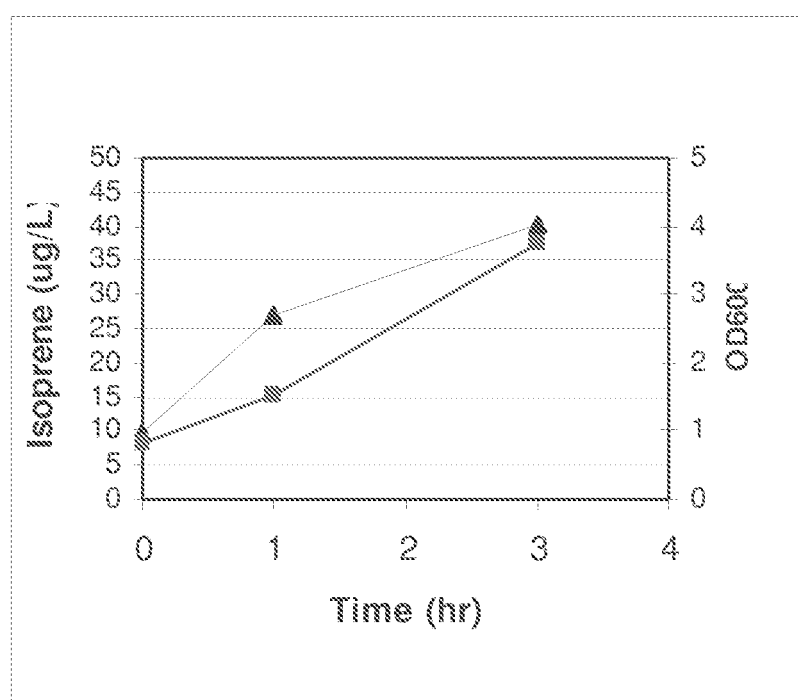


Figure 46D

D.

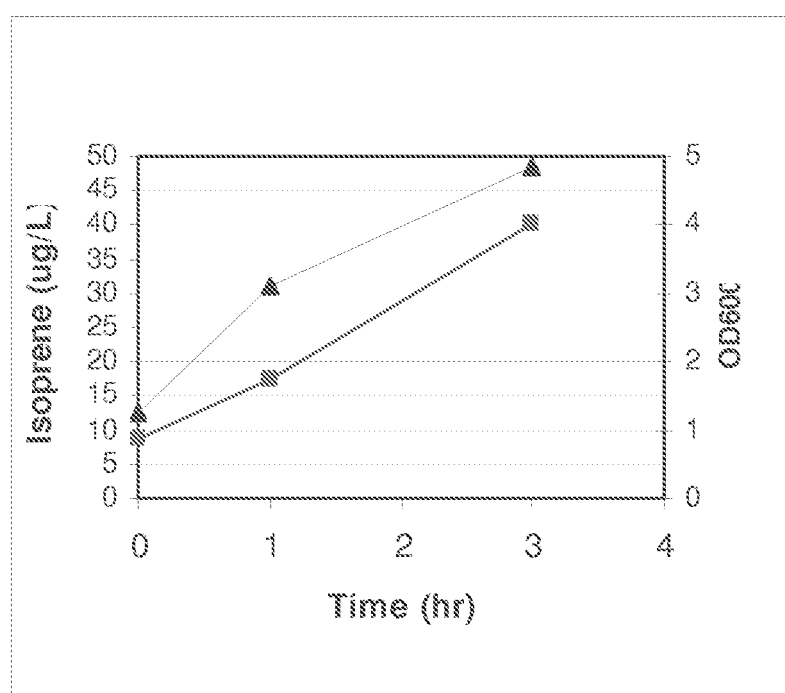


Figure 46E

E.

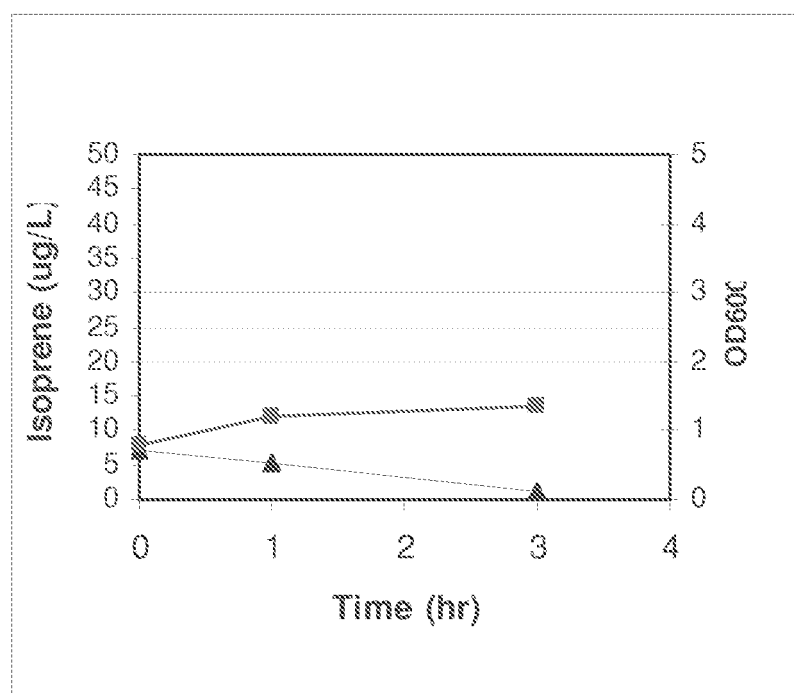


Figure 47A

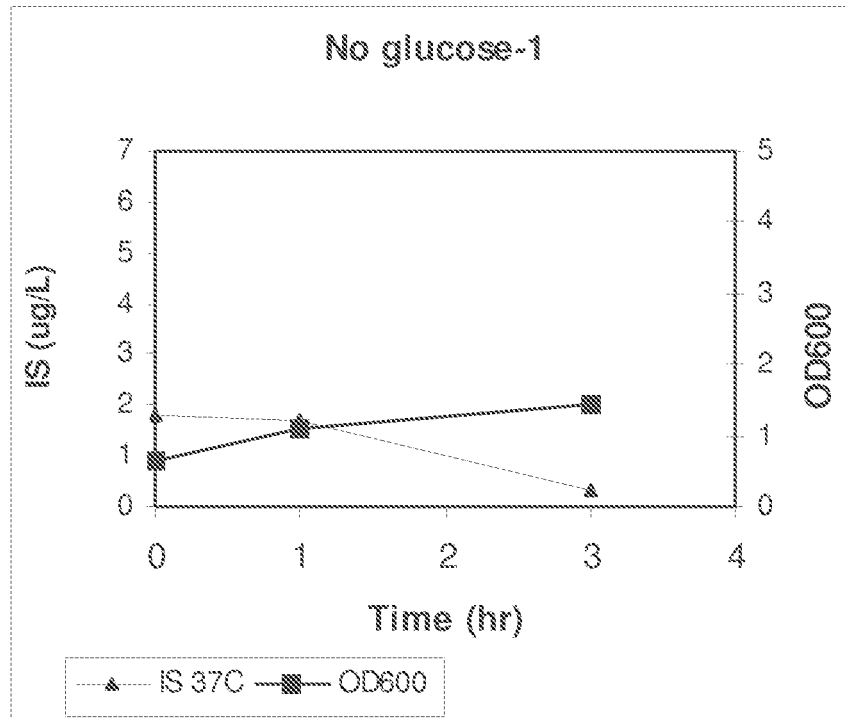


Figure 47B

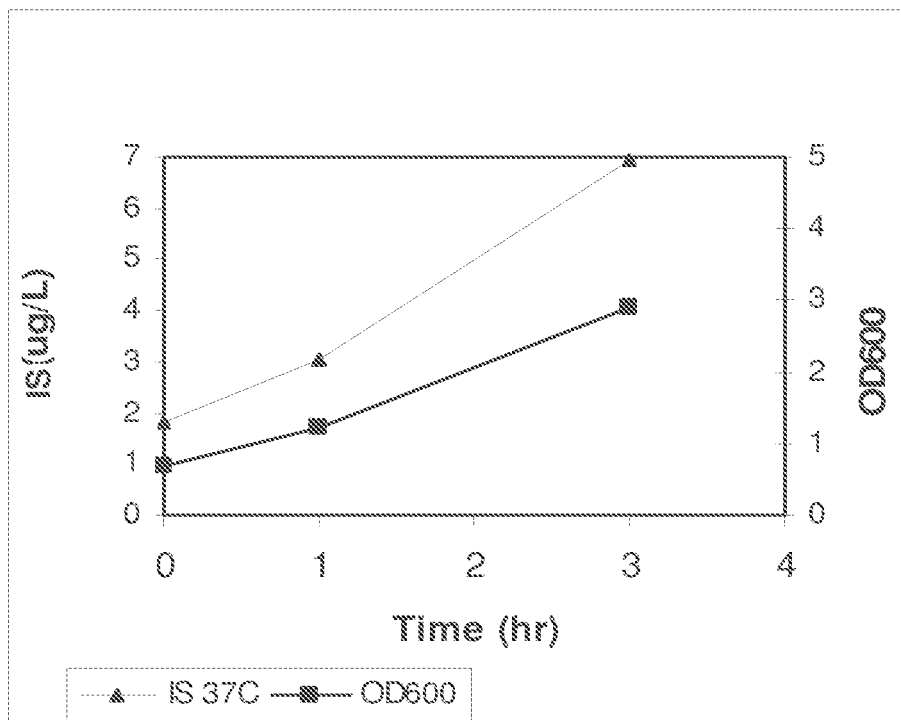


Figure 47C

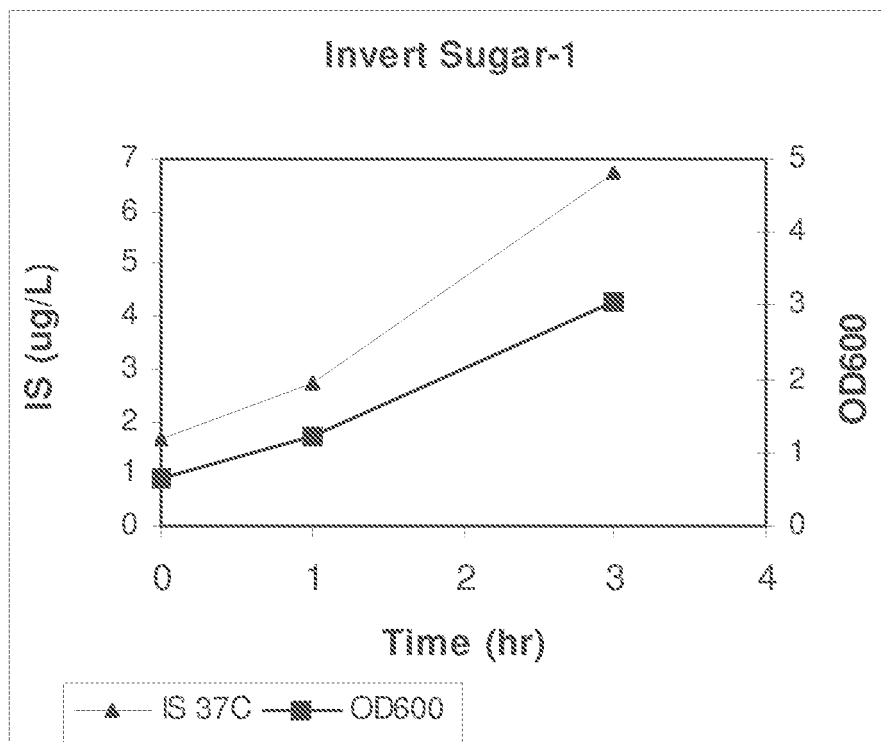


Figure 47D

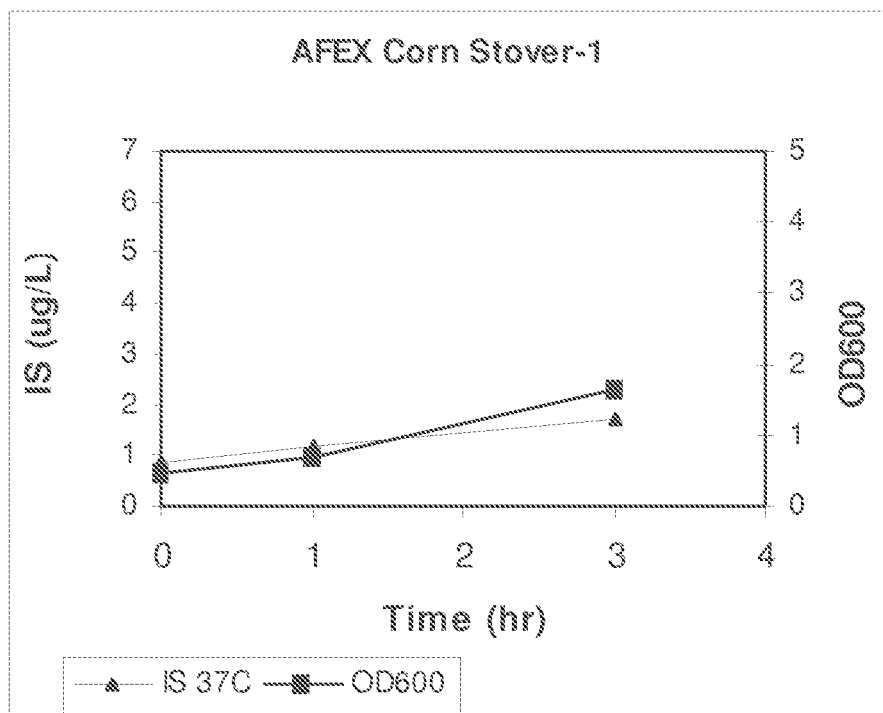


Figure 48A

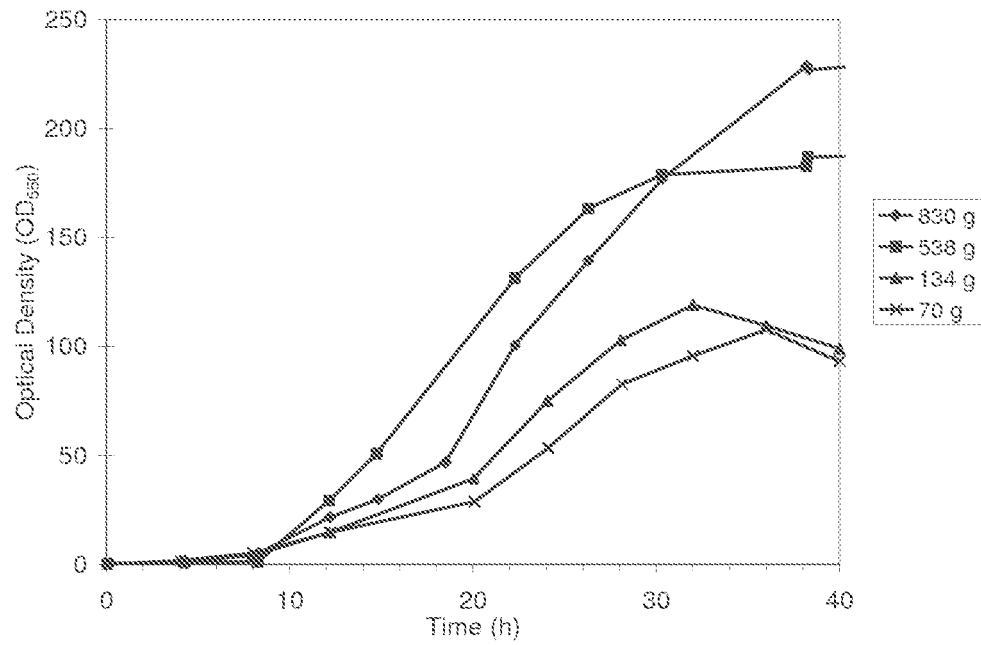


Figure 48B

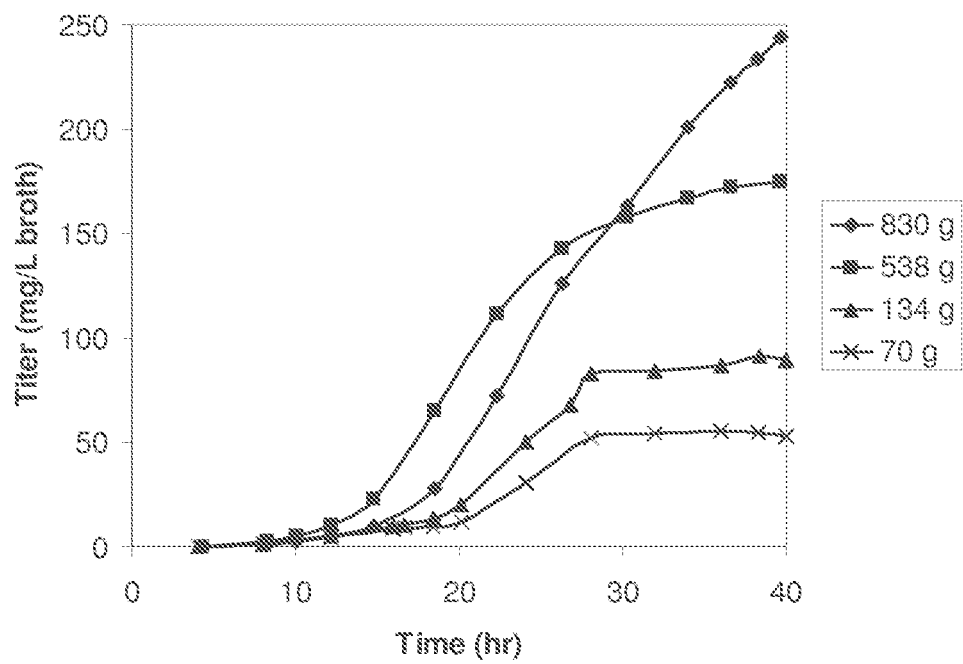


Figure 48C

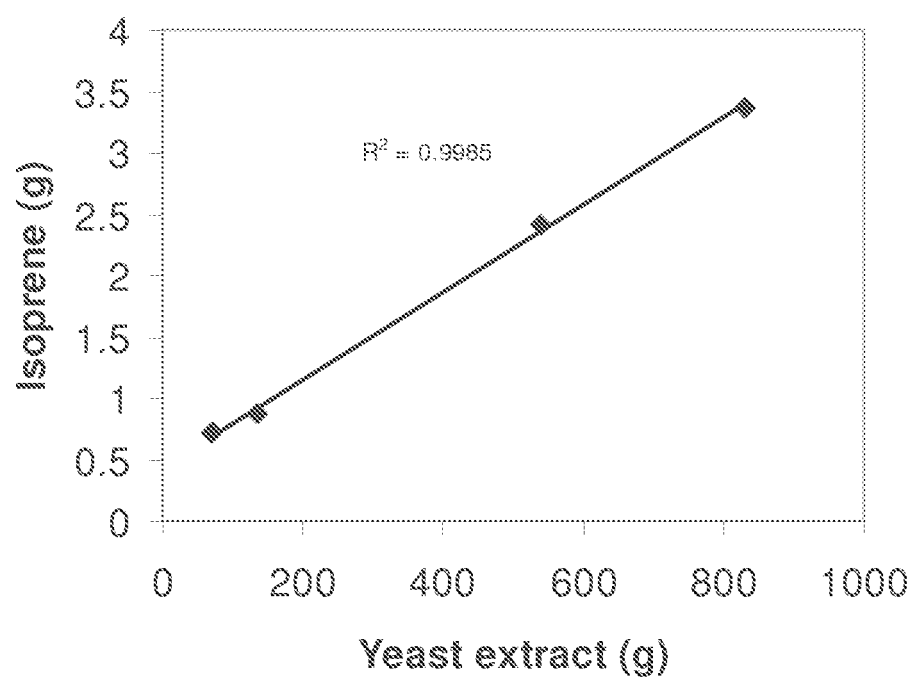


Figure 49A

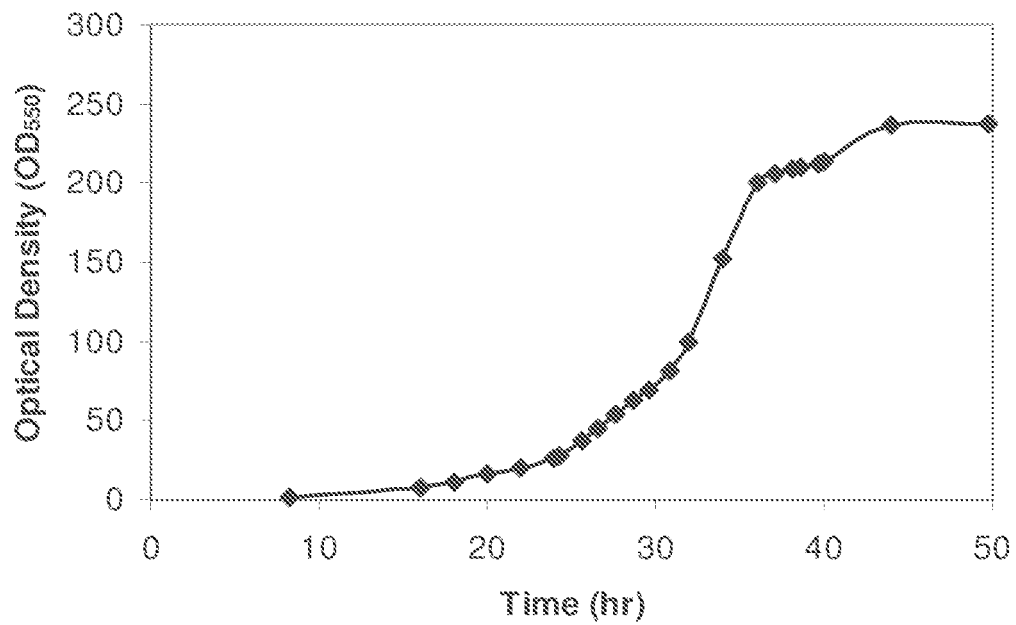


Figure 49B

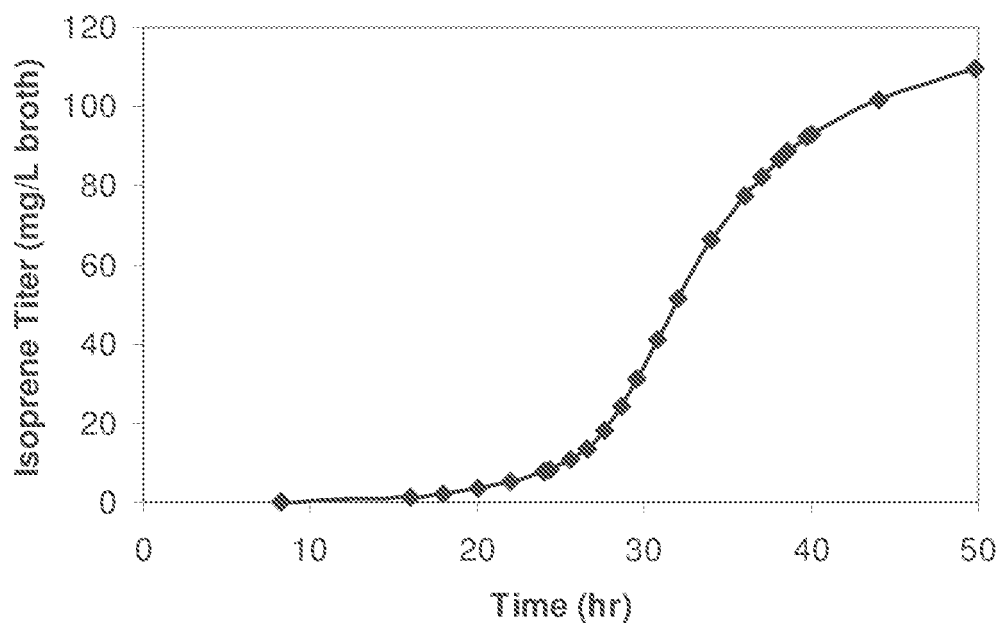


Figure 49C

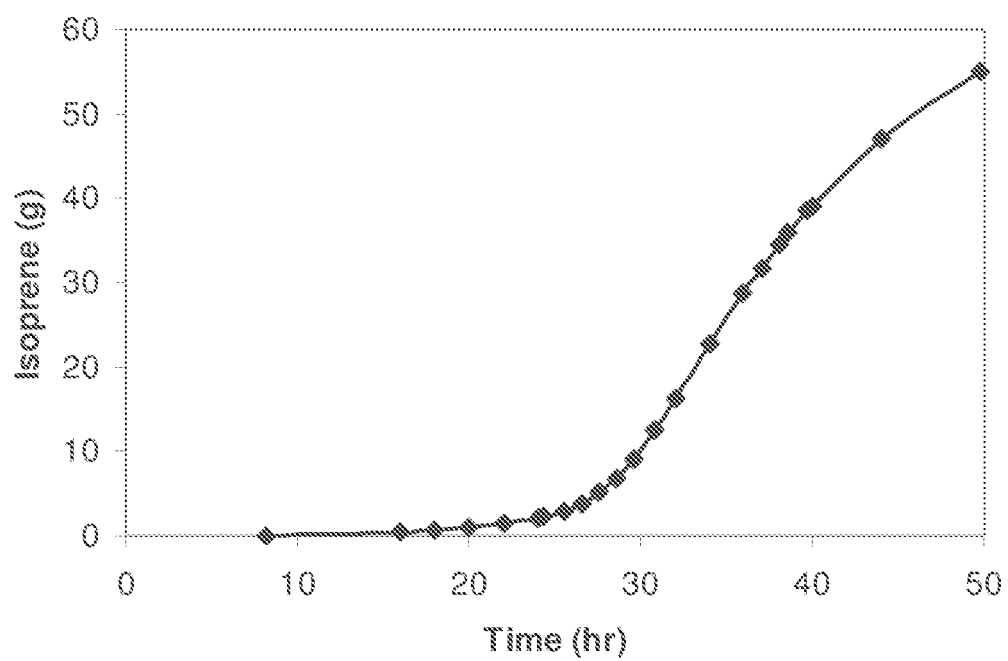


Figure 50

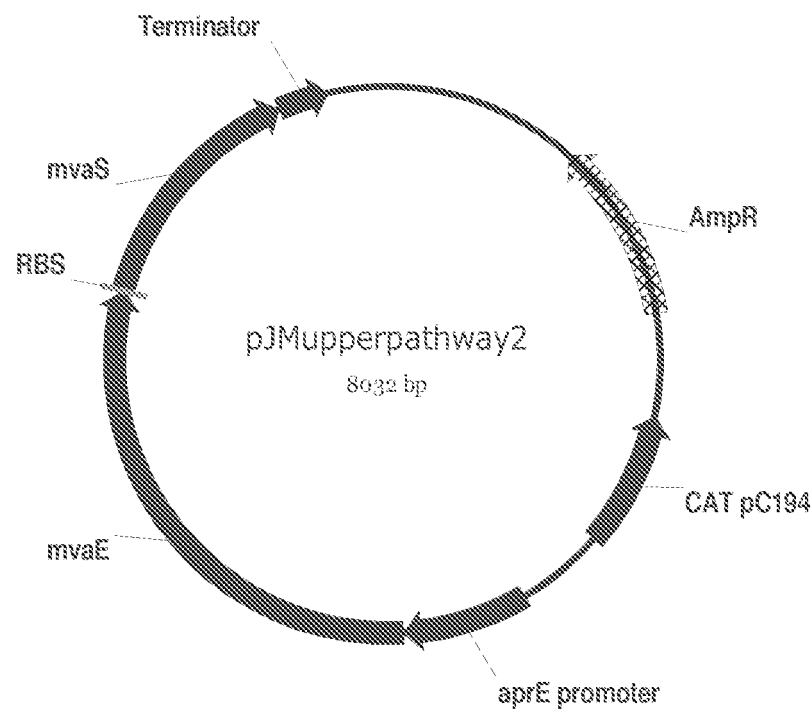


Figure 51A

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Figure 51B

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Figure 51C

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Figure 52

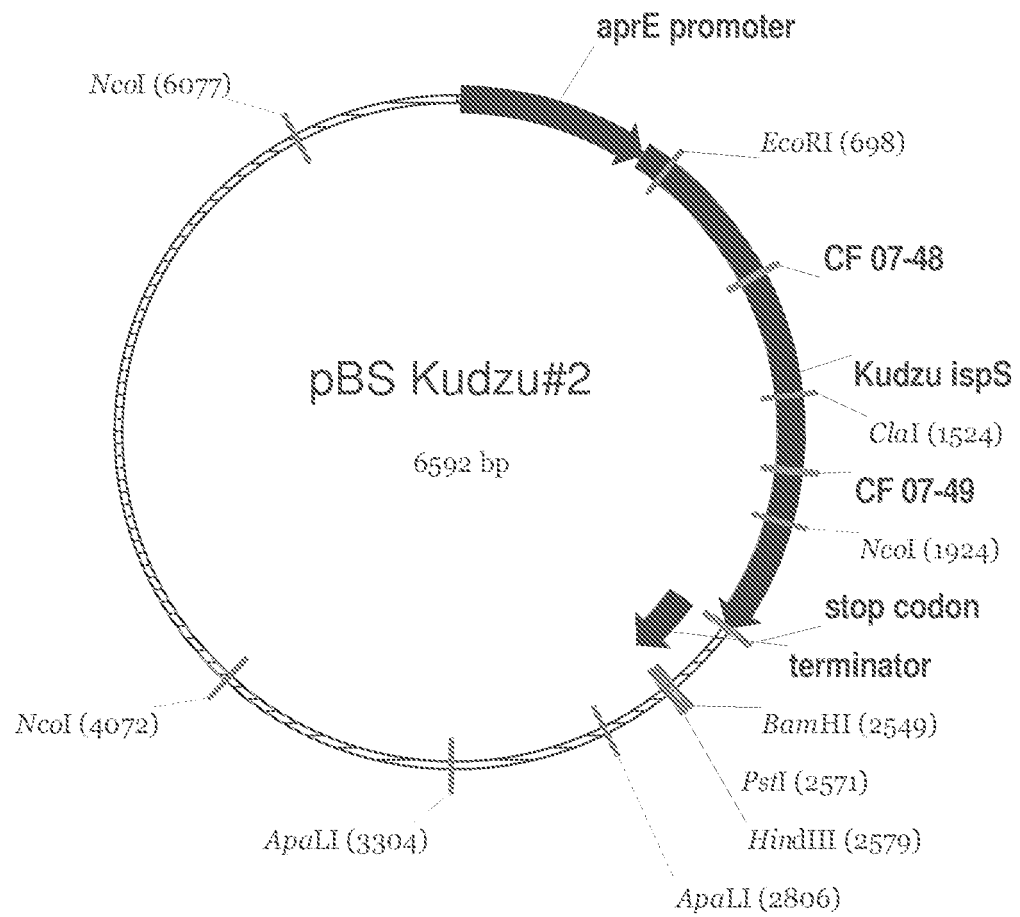


Figure 53A

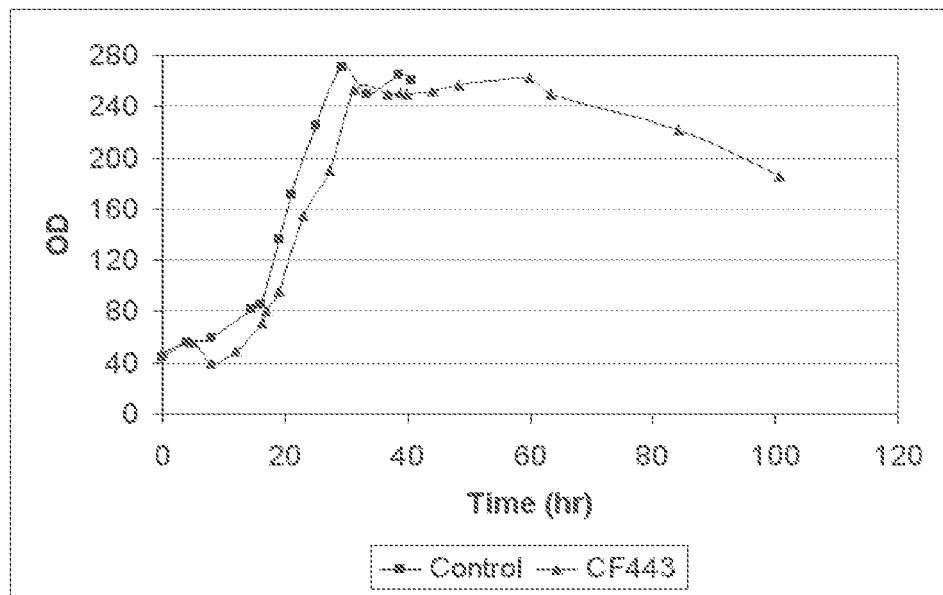


Figure 53B

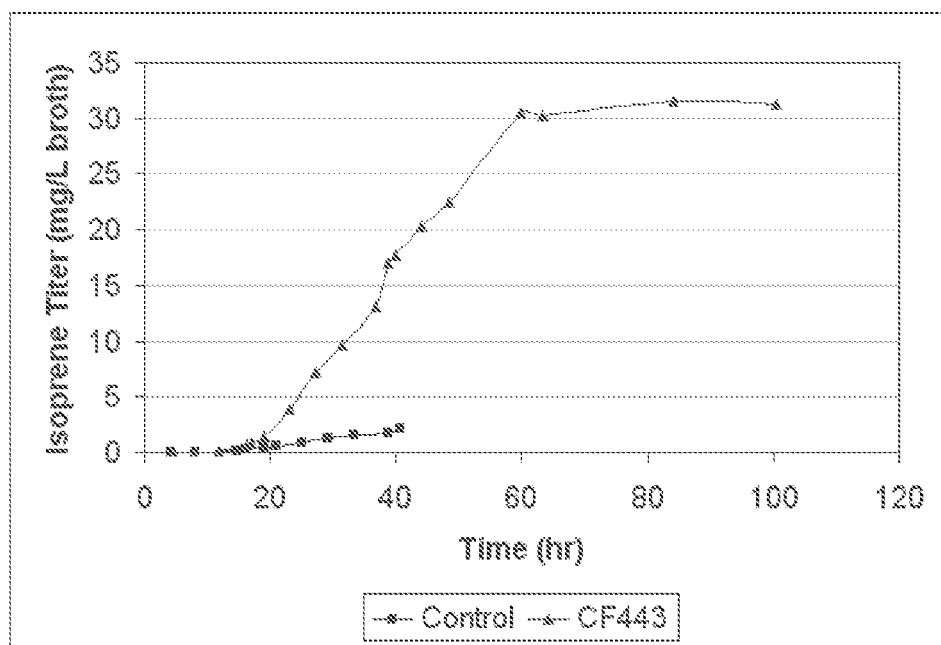


Figure 54

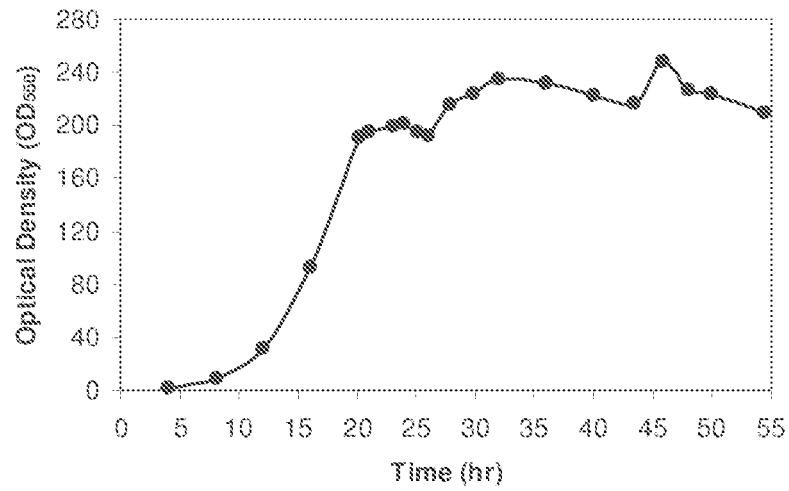


Figure 55

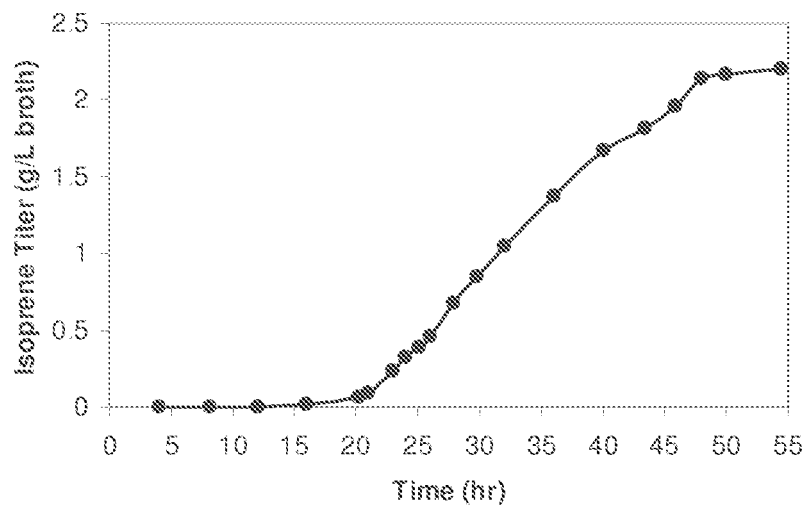


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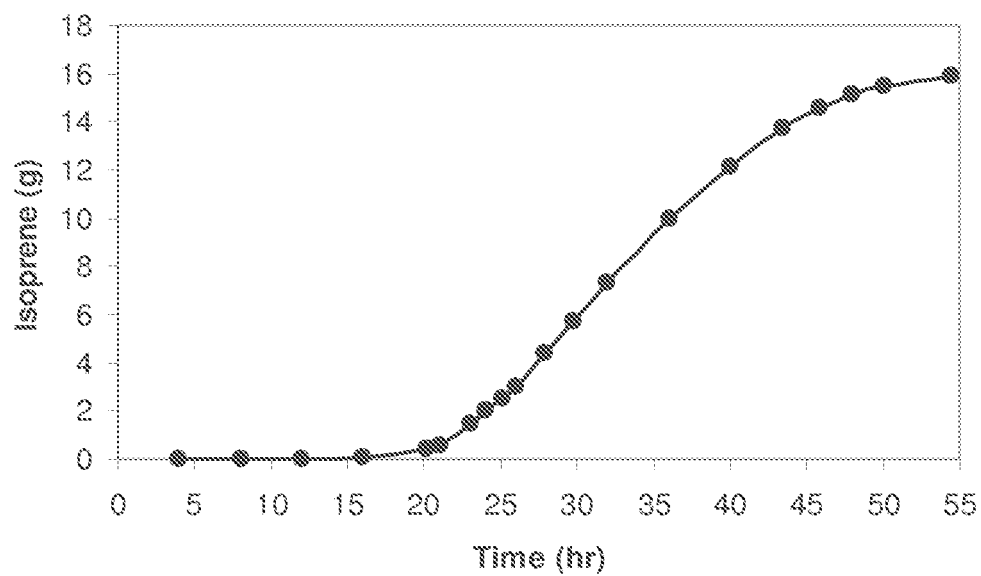


Figure 57

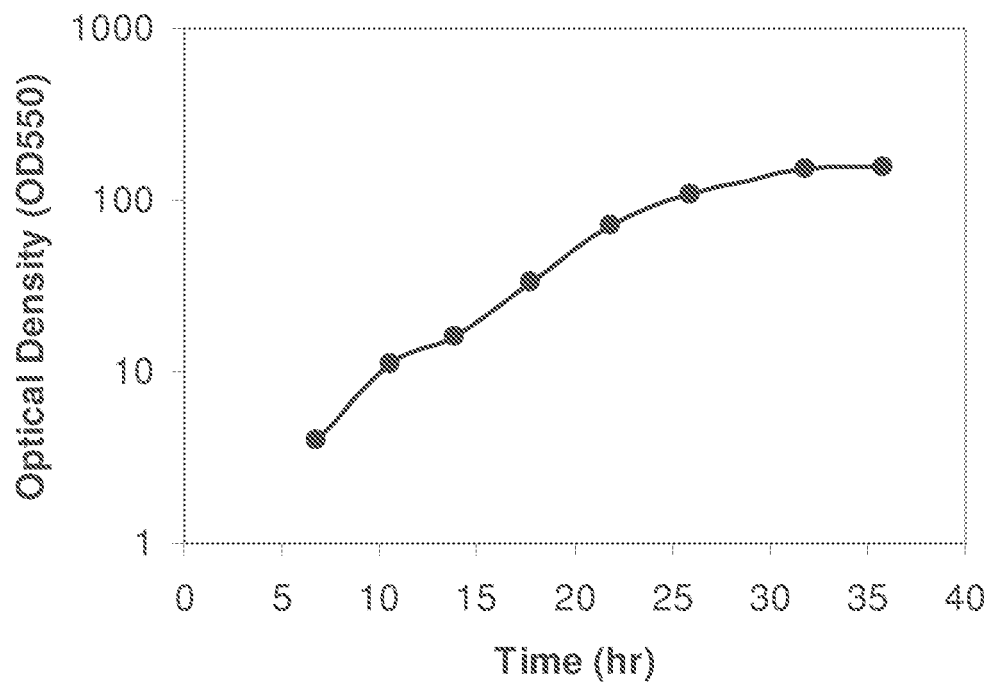


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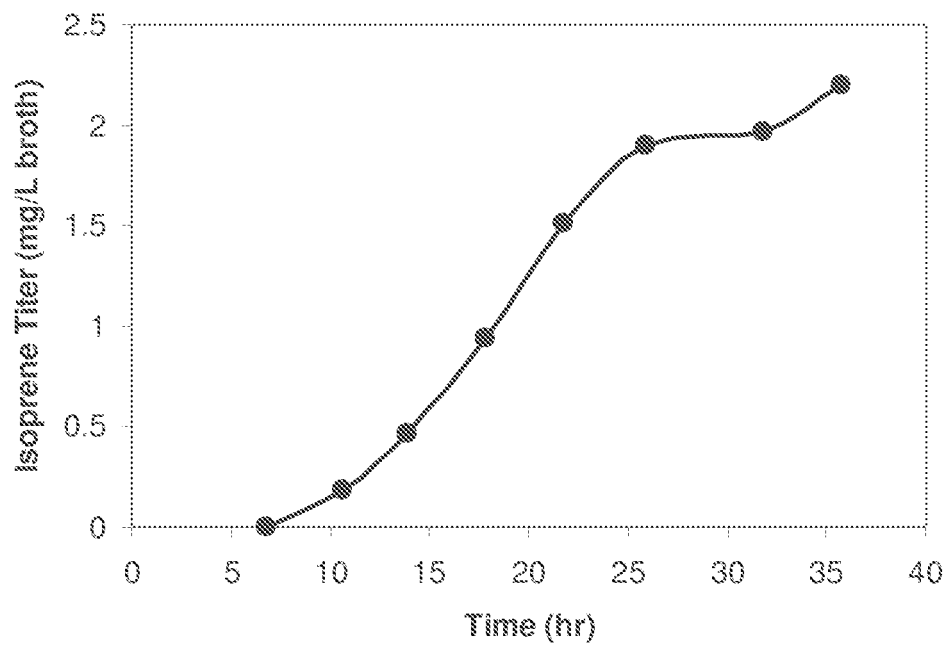


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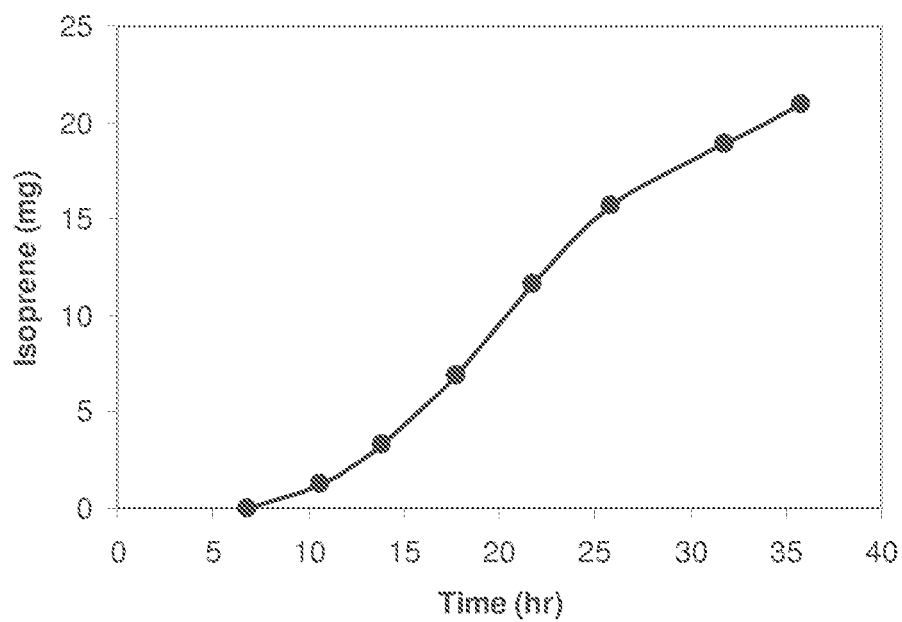


Figure 60

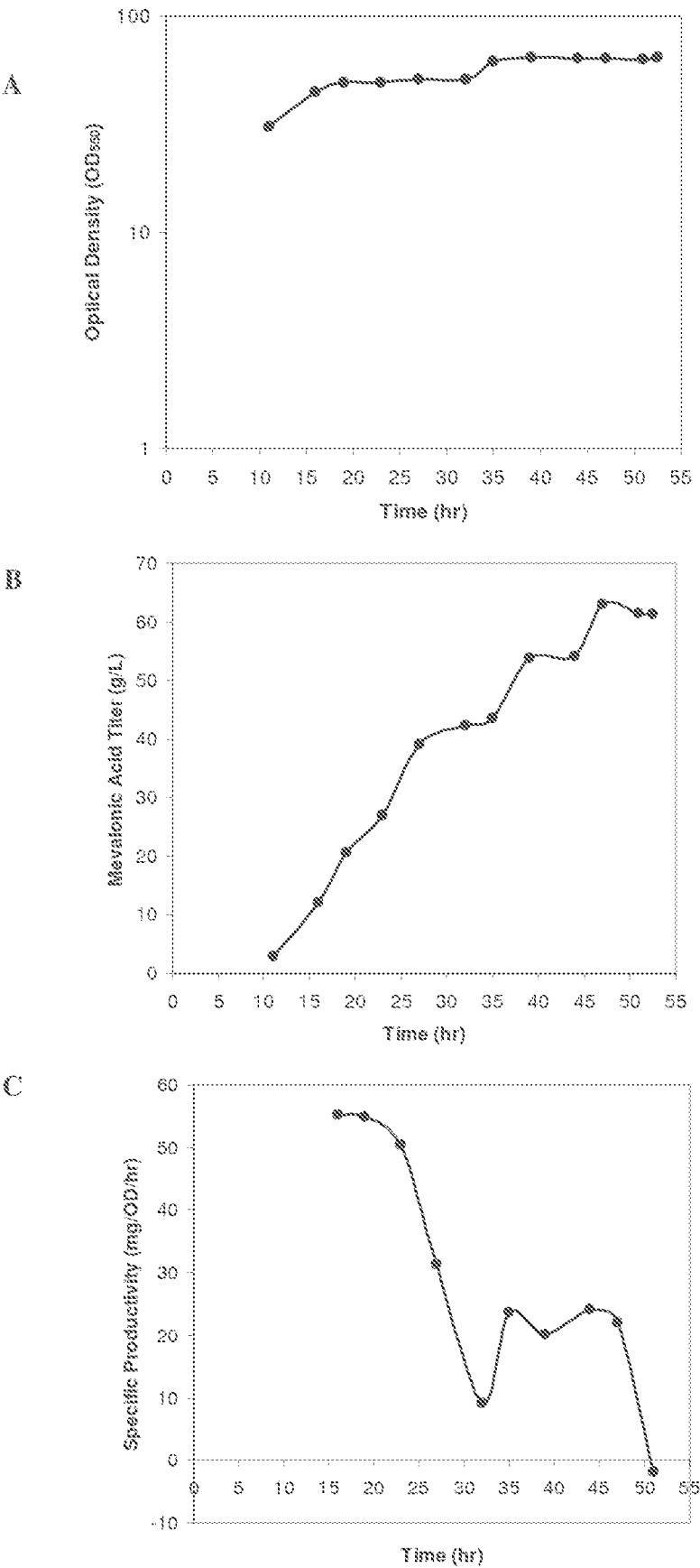


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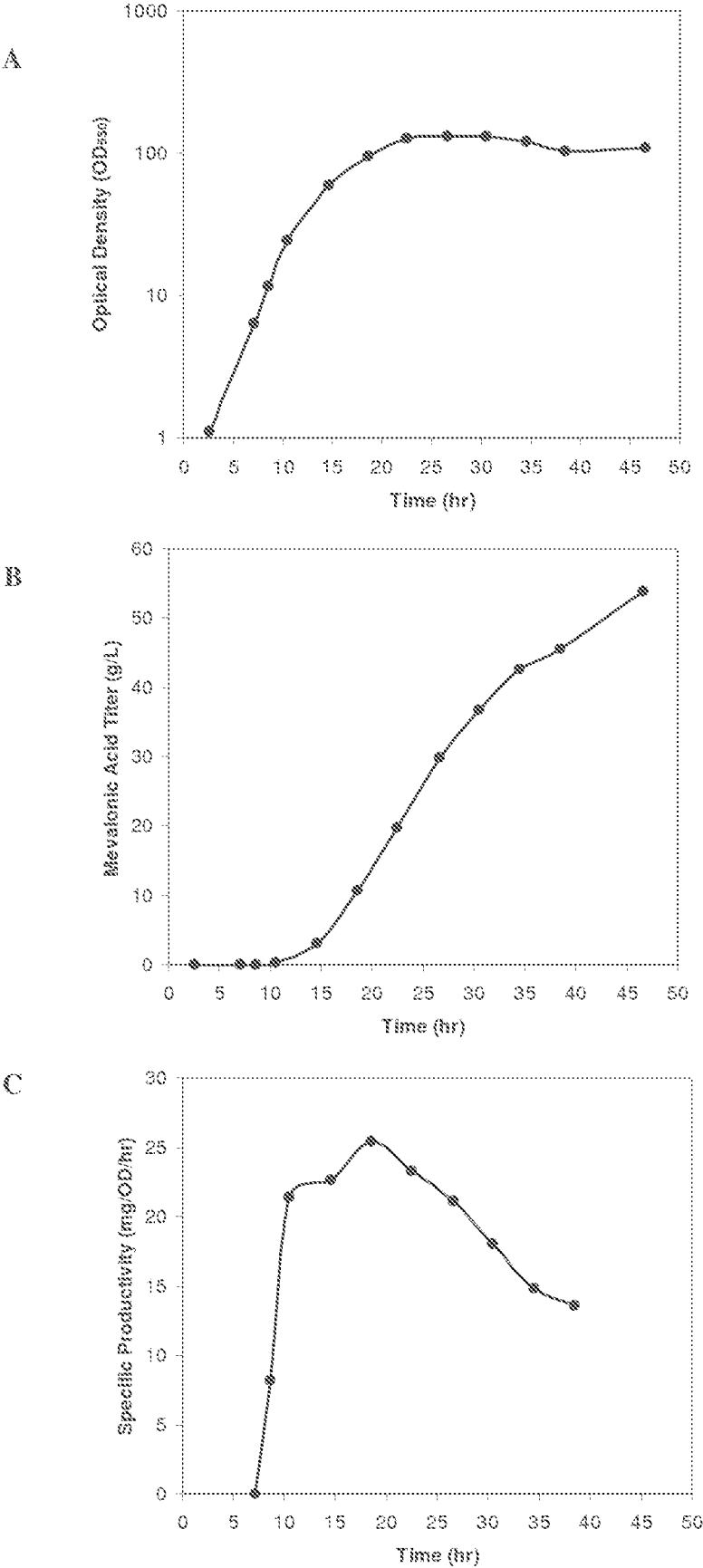
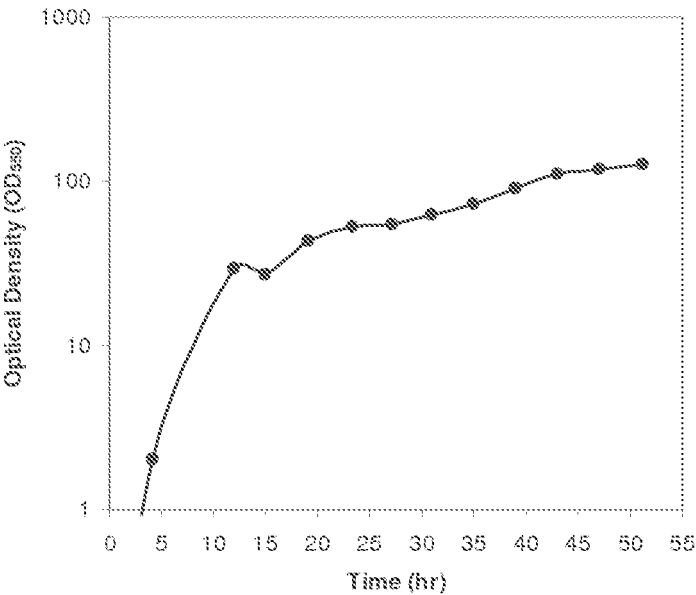
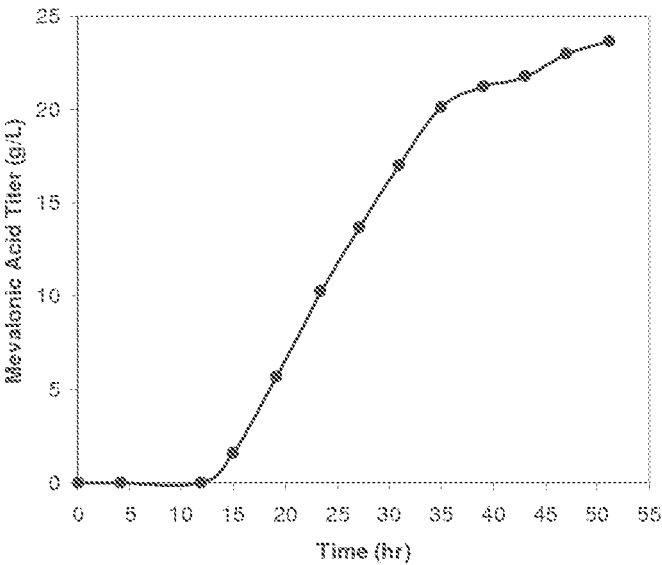


Figure 62

A



B



C

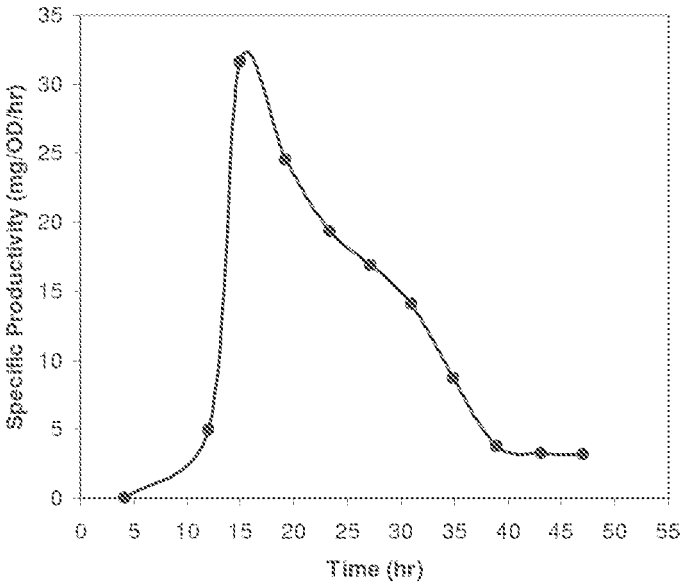
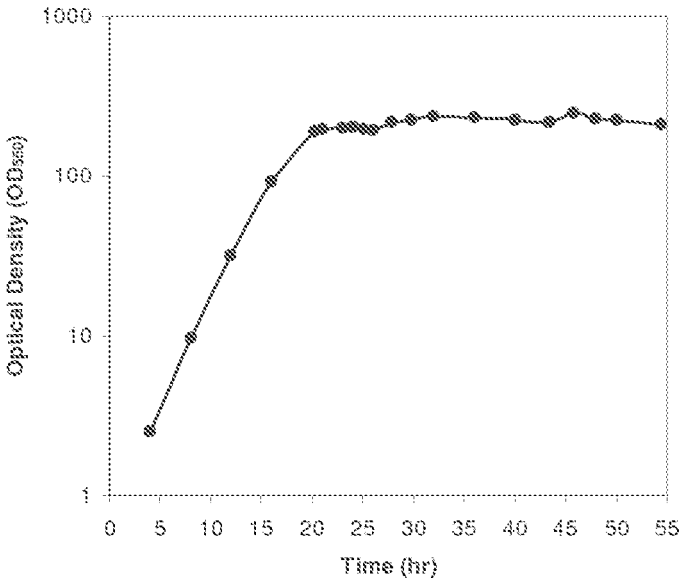
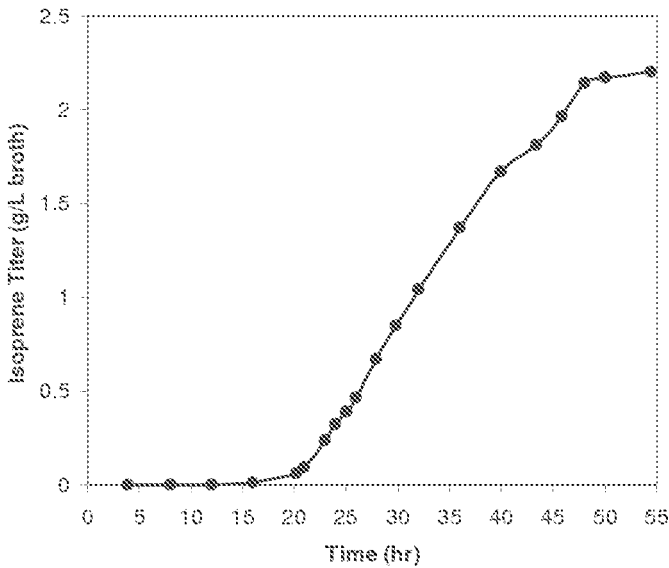


Figure 63

A



B



C

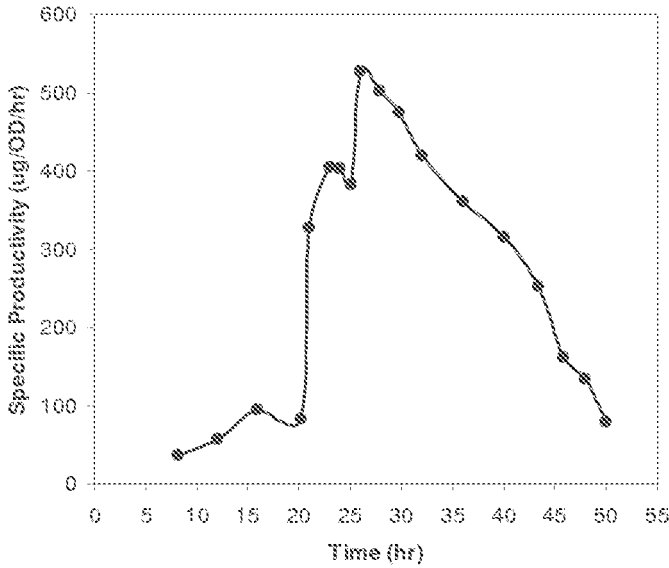
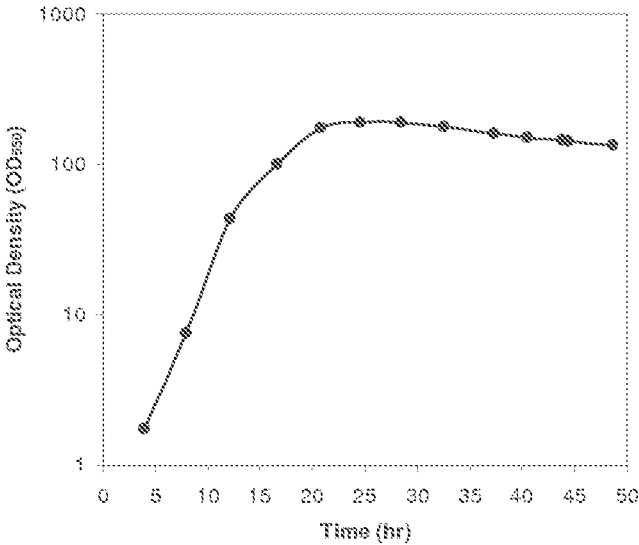
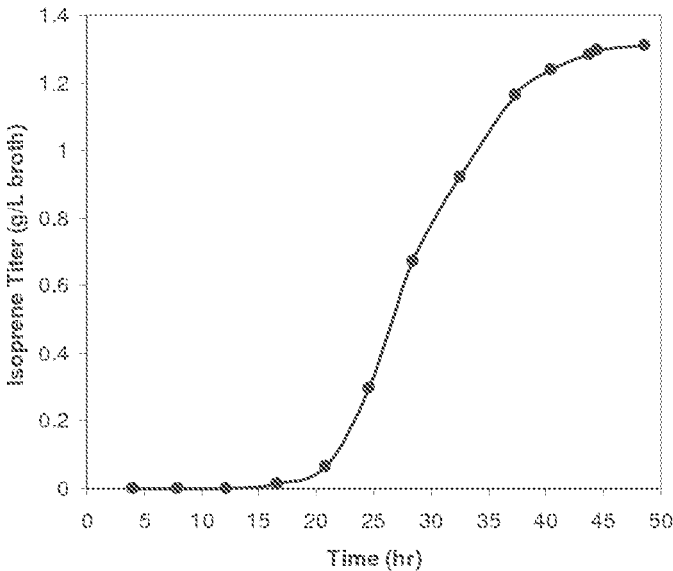


Figure 64

A



B



C

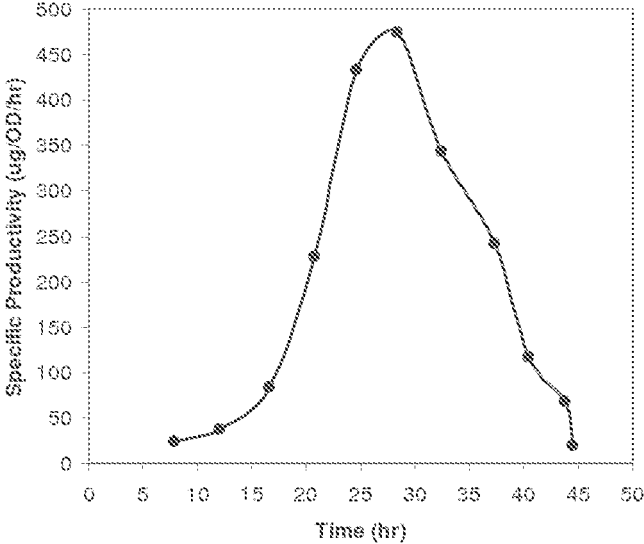
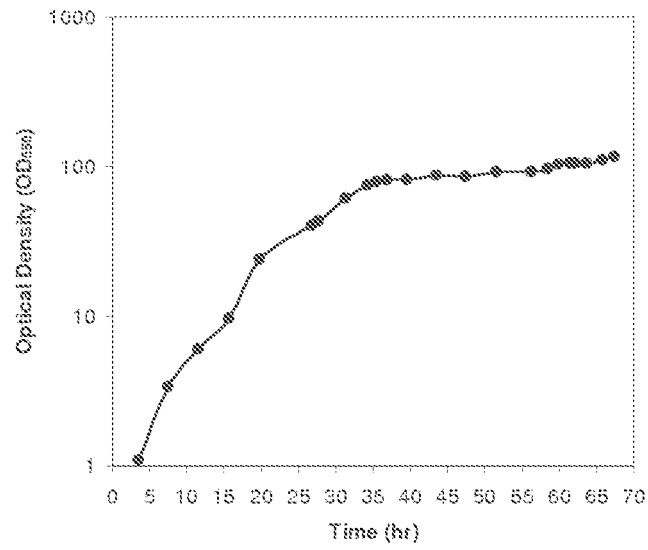
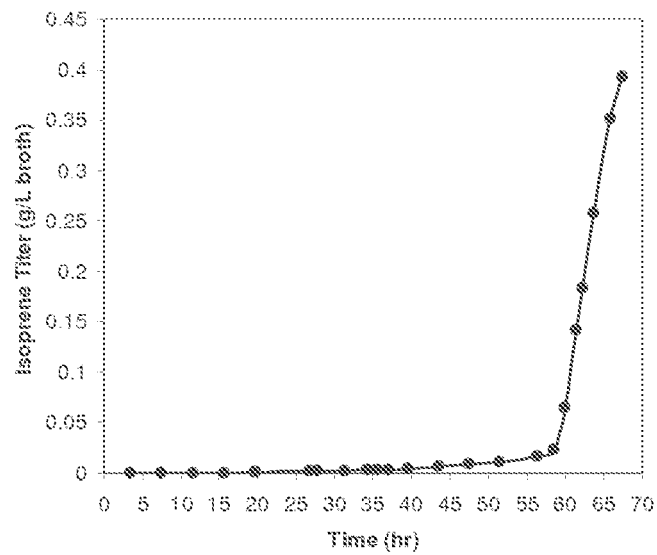


Figure 65

A



B



C

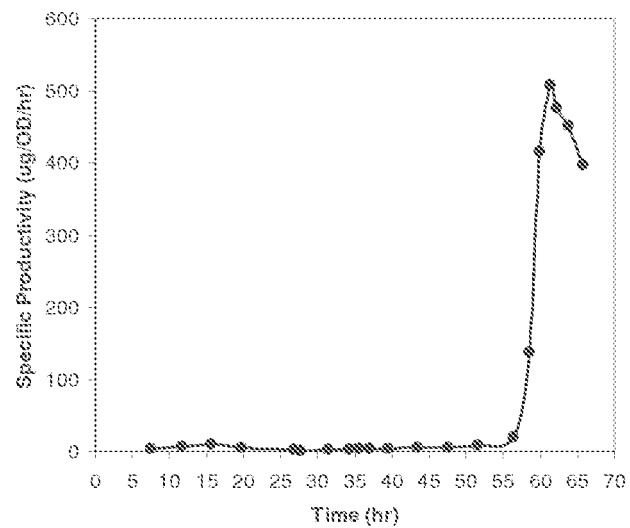
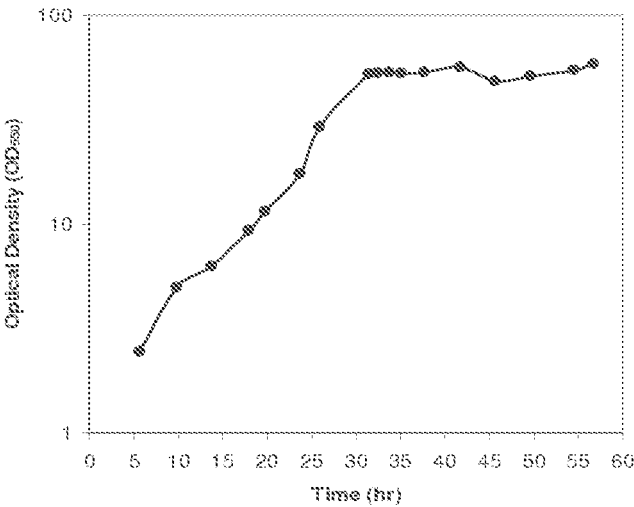
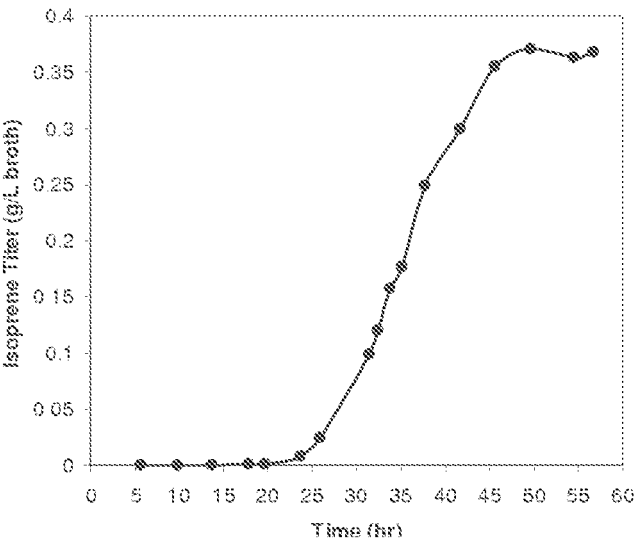


Figure 66

A



B



C

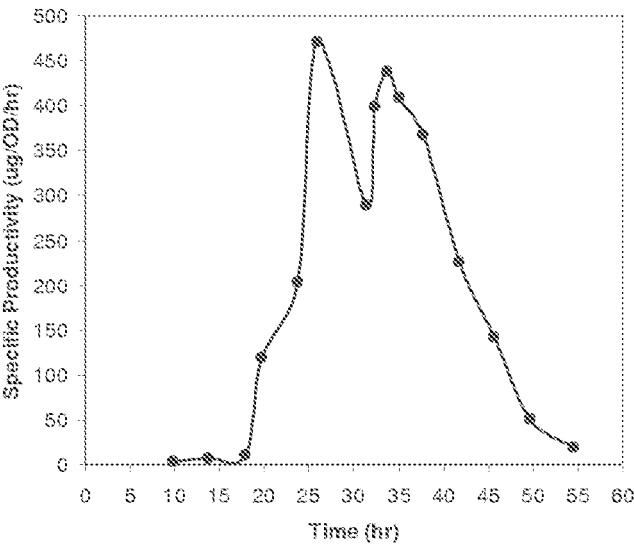


Figure 67

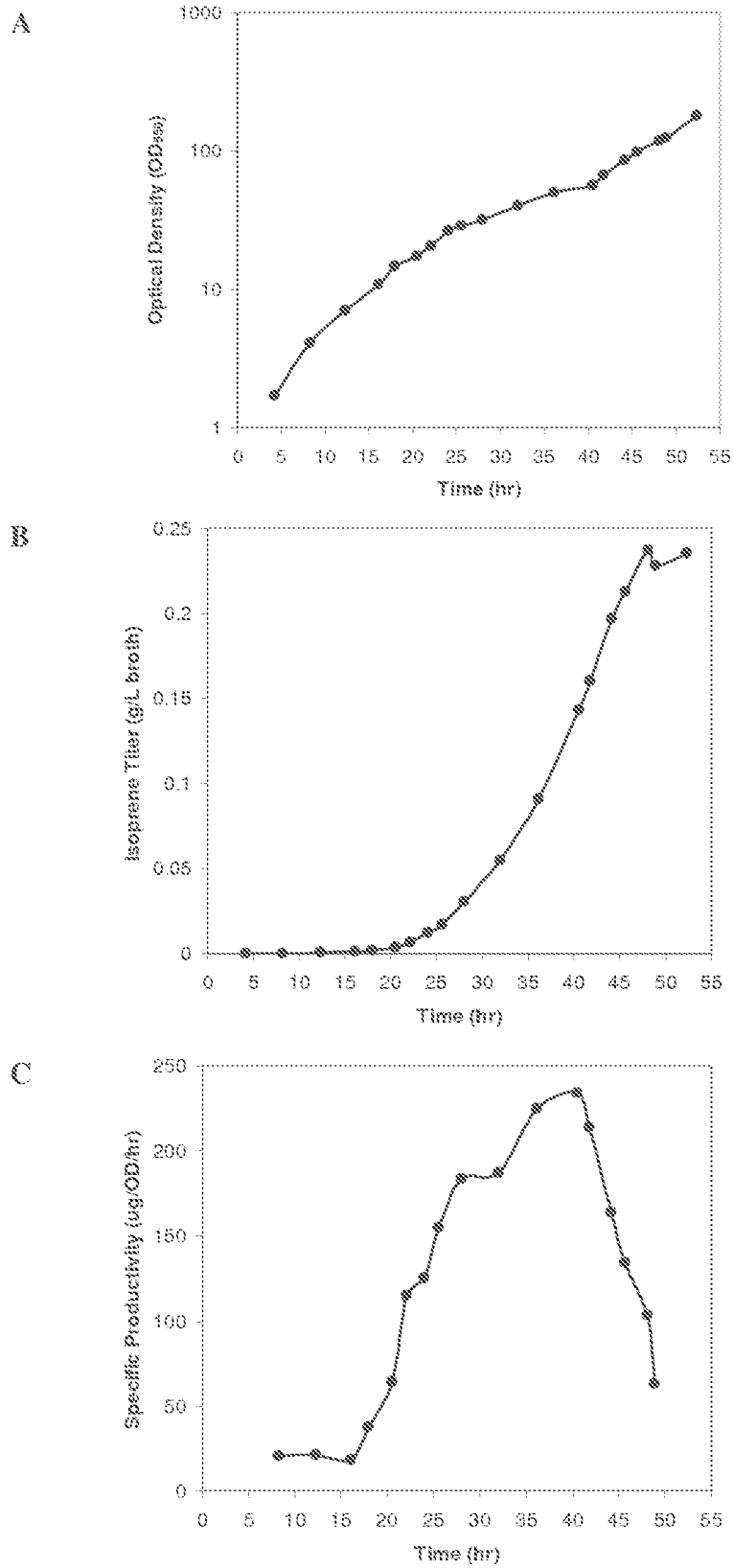


Figure 68

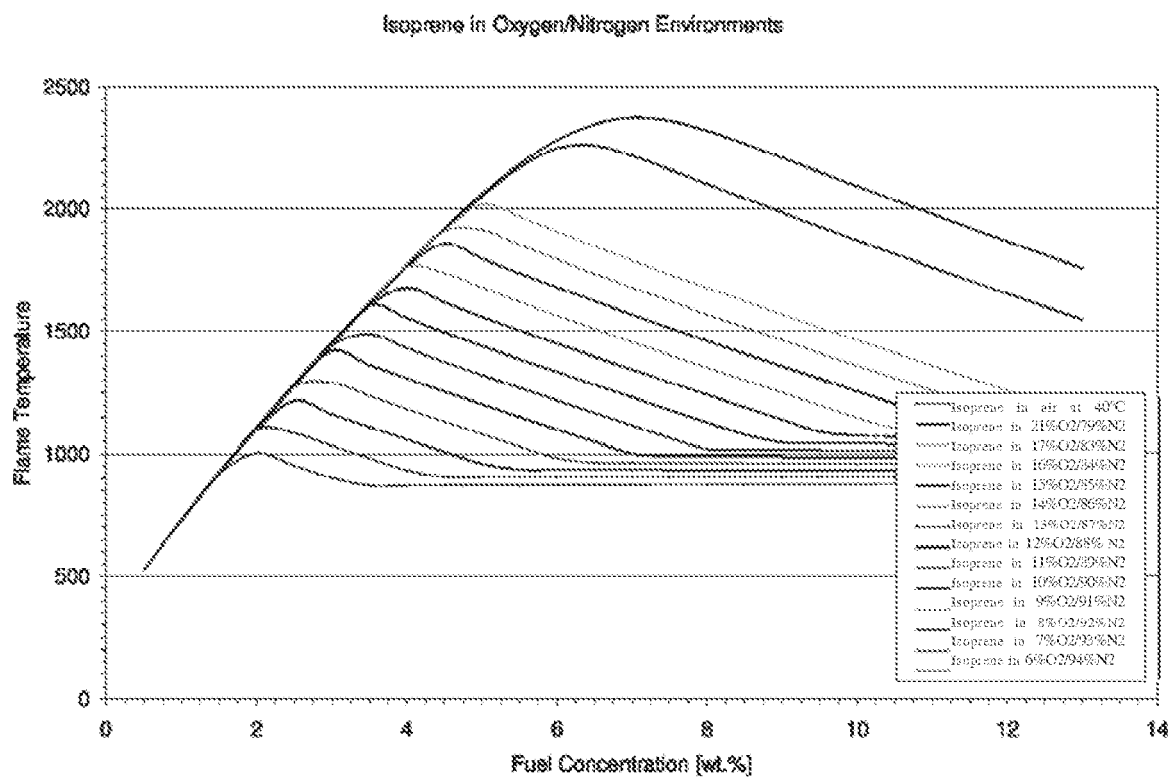


Figure 69

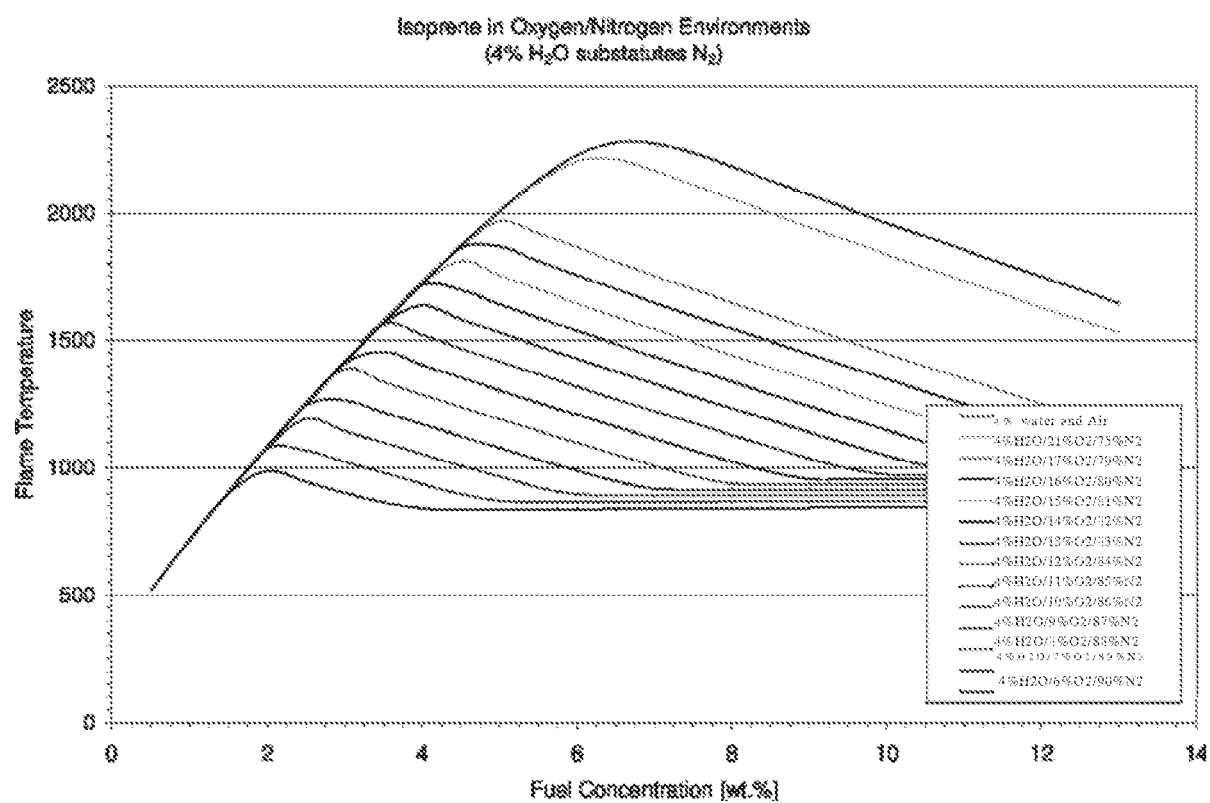


Figure 70

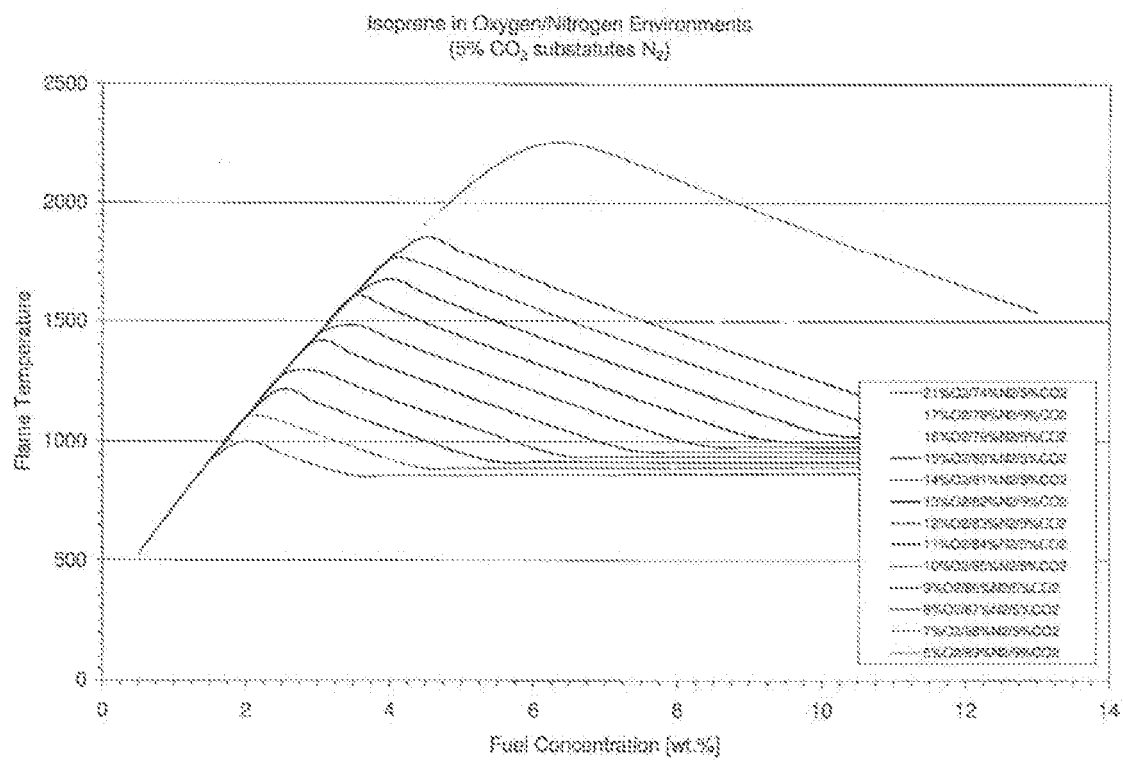


Figure 71

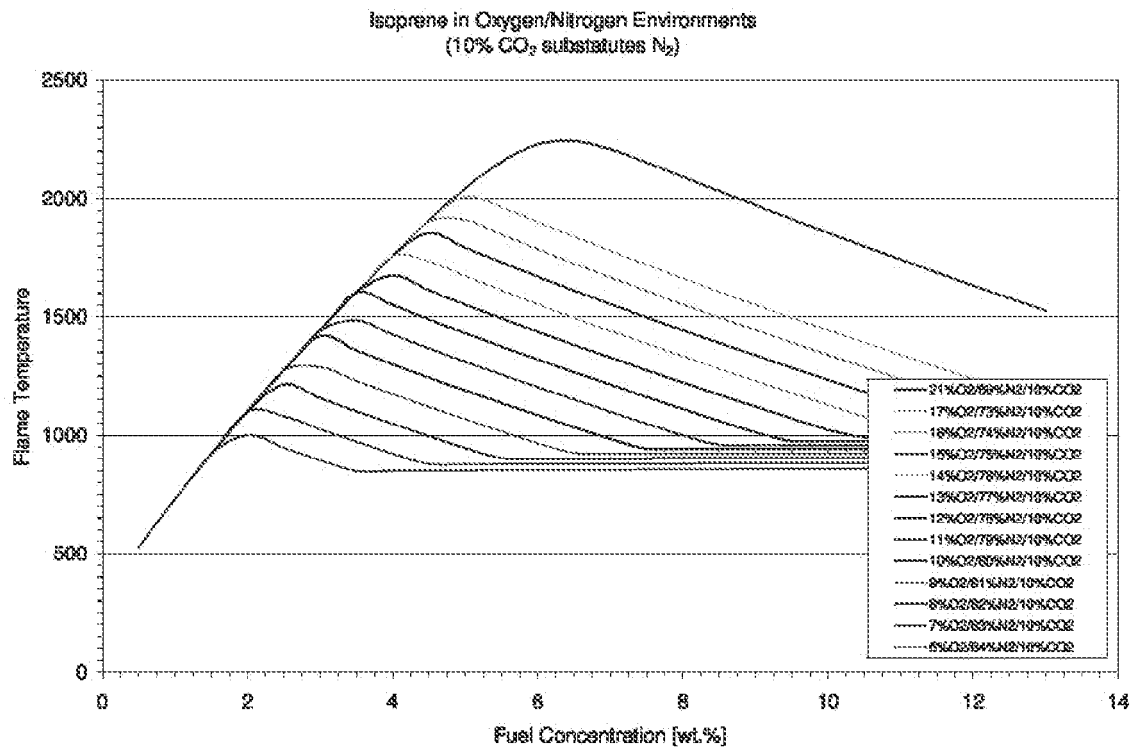


Figure 72

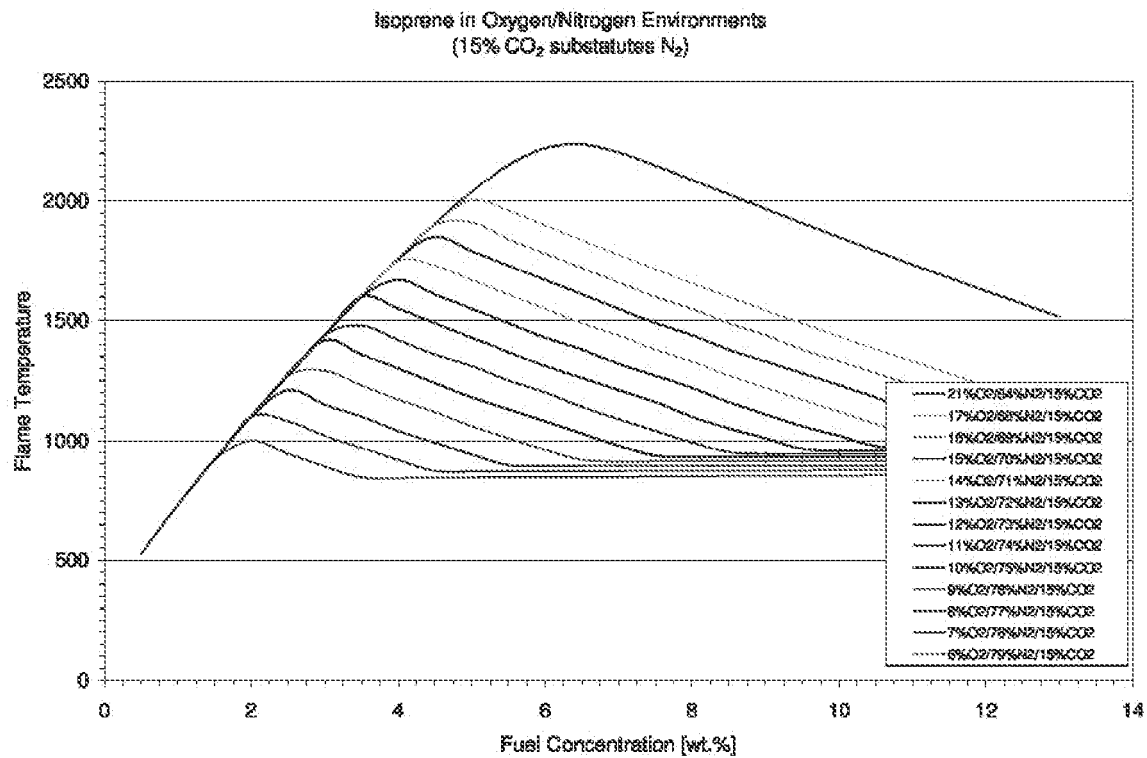


Figure 73

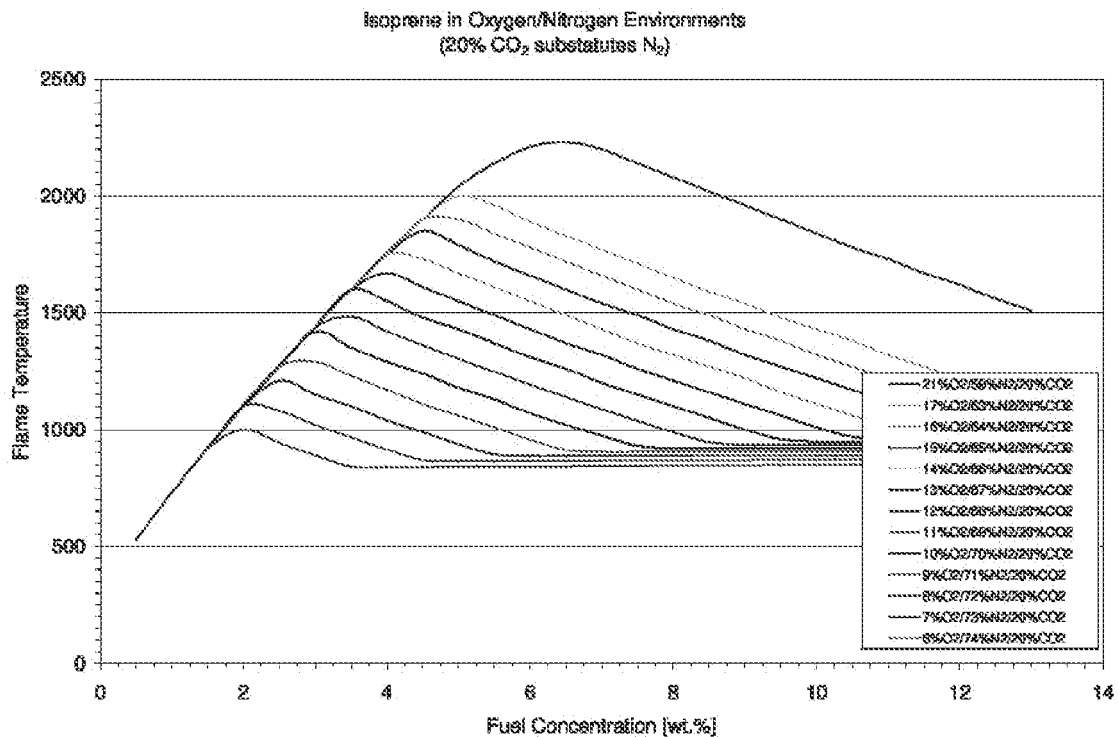


Figure 74

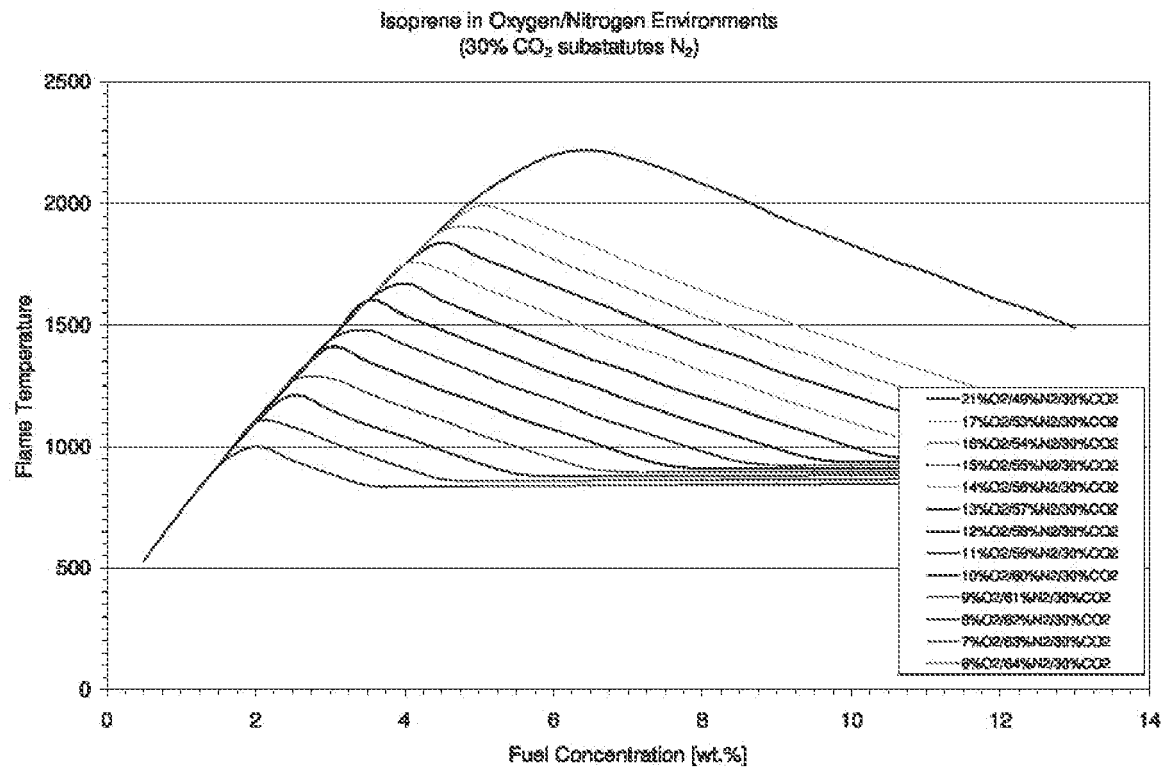


Figure 75A

Concentration at Deflagration																	
Fuel Makeup			Oxidizer Makeup						Molar Concentration based on 100g of sample					Volumetric Concentrations based on ideal gas law			
Fuel Conc.	Oxidizer Conc.	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	100	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	100	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	100	0	14	86	4.56	0.00	42.39	297.52	344.57	1.32	12.30	86.37	0.00			
3.10	96.90	100	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	100	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	100	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	100	0	21	79	4.56	0.00	63.59	273.40	341.55	1.33	16.62	80.05	0.00			
3.50	96.50	100	0	11.1	88.9	5.15	0.00	33.47	306.39	345.01	1.49	9.70	86.61	0.00			
4.40	95.60	100	0	12	88	6.47	0.00	35.85	300.46	342.78	1.89	10.46	87.55	0.00			
5.50	94.50	100	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	100	0	14	86	9.71	0.00	40.86	286.87	337.44	2.88	12.11	85.01	0.00			
7.60	92.40	100	0	15	85	11.18	0.00	43.31	280.50	334.99	3.94	12.93	83.73	0.00			
8.50	91.50	100	0	16	84	12.50	0.00	45.75	274.50	332.75	3.76	13.75	82.49	0.00			
9.50	90.40	100	0	17	83	14.12	0.00	48.03	267.97	330.11	4.28	14.55	81.18	0.00			
13.50	86.50	100	0	21	79	19.85	0.00	56.77	244.05	320.67	6.19	17.70	76.11	0.00			

Figure 75B

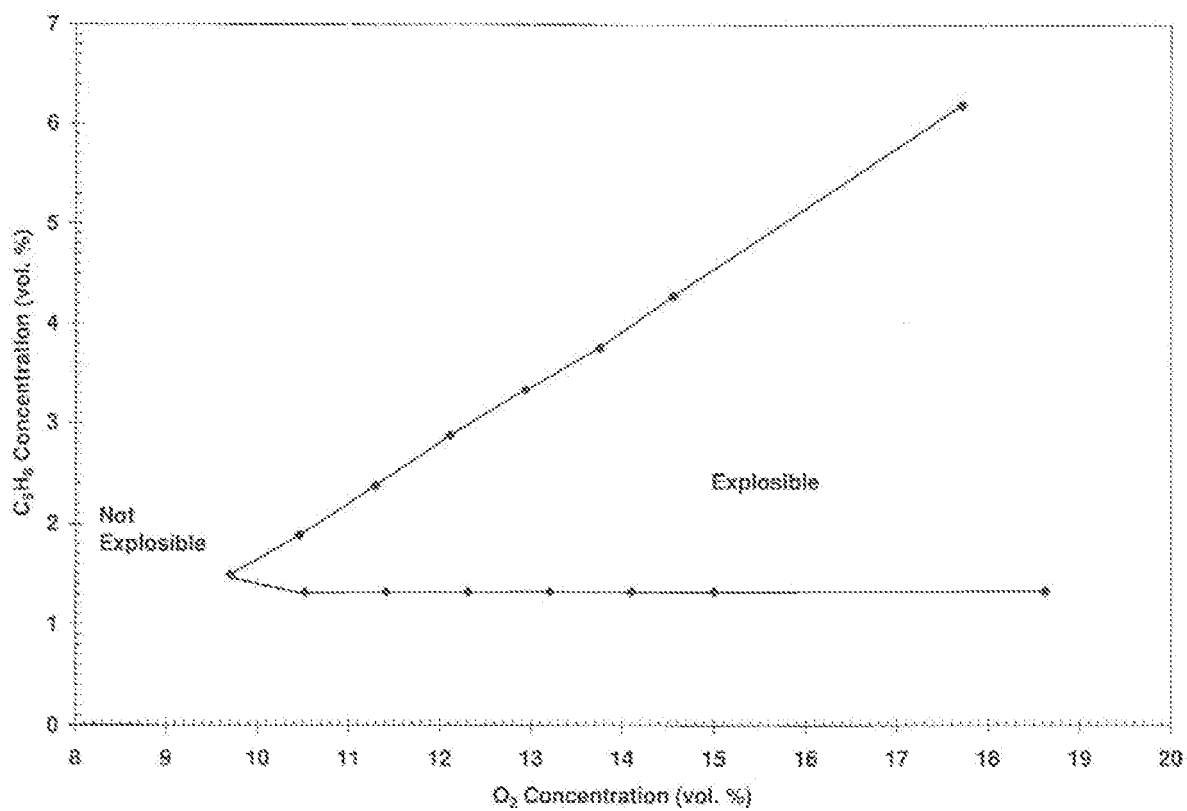


Figure 76A

Concentration at Deflagration															
		Fuel Makeup	Oxidizer Makeup				Molar Concentration based on 100g of sample					Volumetric Concentrations based on ideal gas law			
Fuel Conc.	Oxidizer Conc.	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	1.36	10.28	82.27	6.09	
3.274	96.726	100	4	13	83	4.81	21.49	39.29	286.72	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	351.49	1.38	12.90	79.61	6.12	
3.286	96.714	100	4	16	80	4.83	21.49	48.36	276.33	351.01	1.38	13.78	78.72	6.12	
3.284	96.716	100	4	17	79	4.83	21.49	51.38	272.88	350.58	1.38	14.66	77.84	6.13	
3.276	96.724	100	4	21	75	4.82	21.49	63.48	259.08	348.87	1.38	18.19	74.26	6.16	
3.500	96.500	100	4	11.5	84.5	5.15	21.44	34.68	291.22	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	350.78	1.76	10.24	81.93	6.07	
5.900	94.700	100	4	13	83	7.79	21.04	38.47	280.72	348.03	2.24	11.05	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	43.41	267.98	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	13.46	76.89	5.98	
9.400	90.600	100	4	17	79	13.82	20.13	48.13	255.62	337.71	4.09	14.25	75.69	5.96	
13.300	86.700	100	4	21	75	19.56	19.27	56.90	232.23	327.95	5.96	17.35	70.81	5.87	

Figure 76B

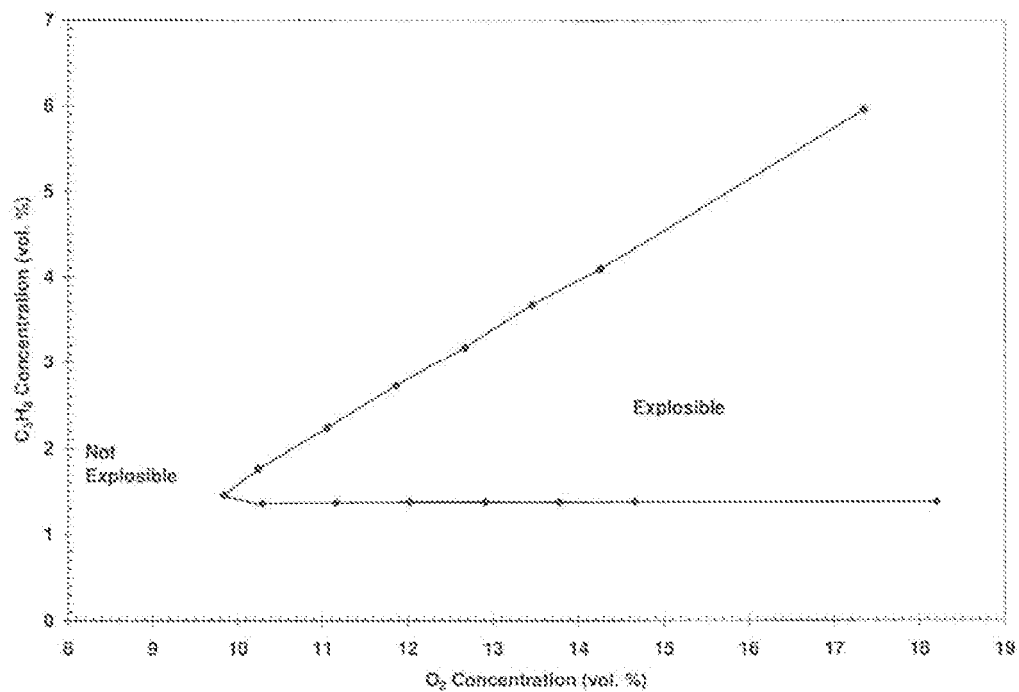


Figure 77

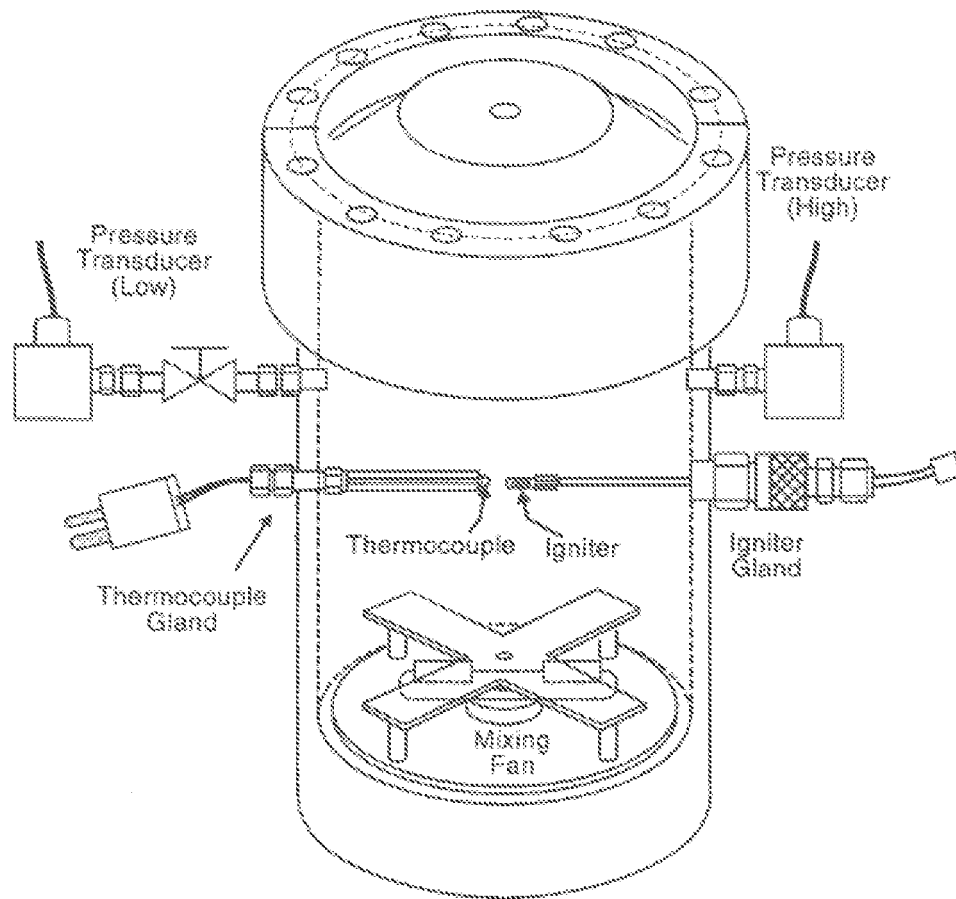


Figure 78A

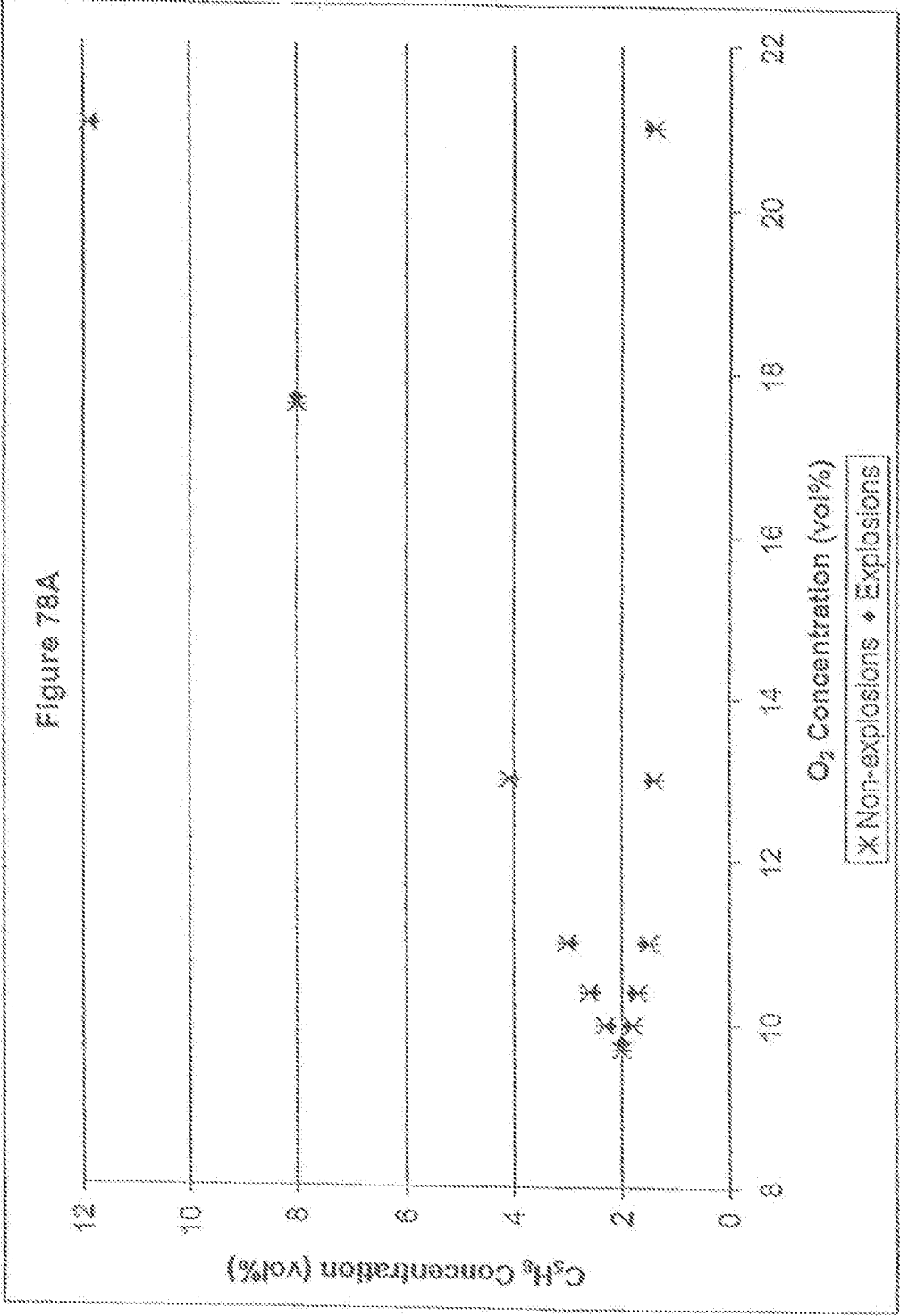
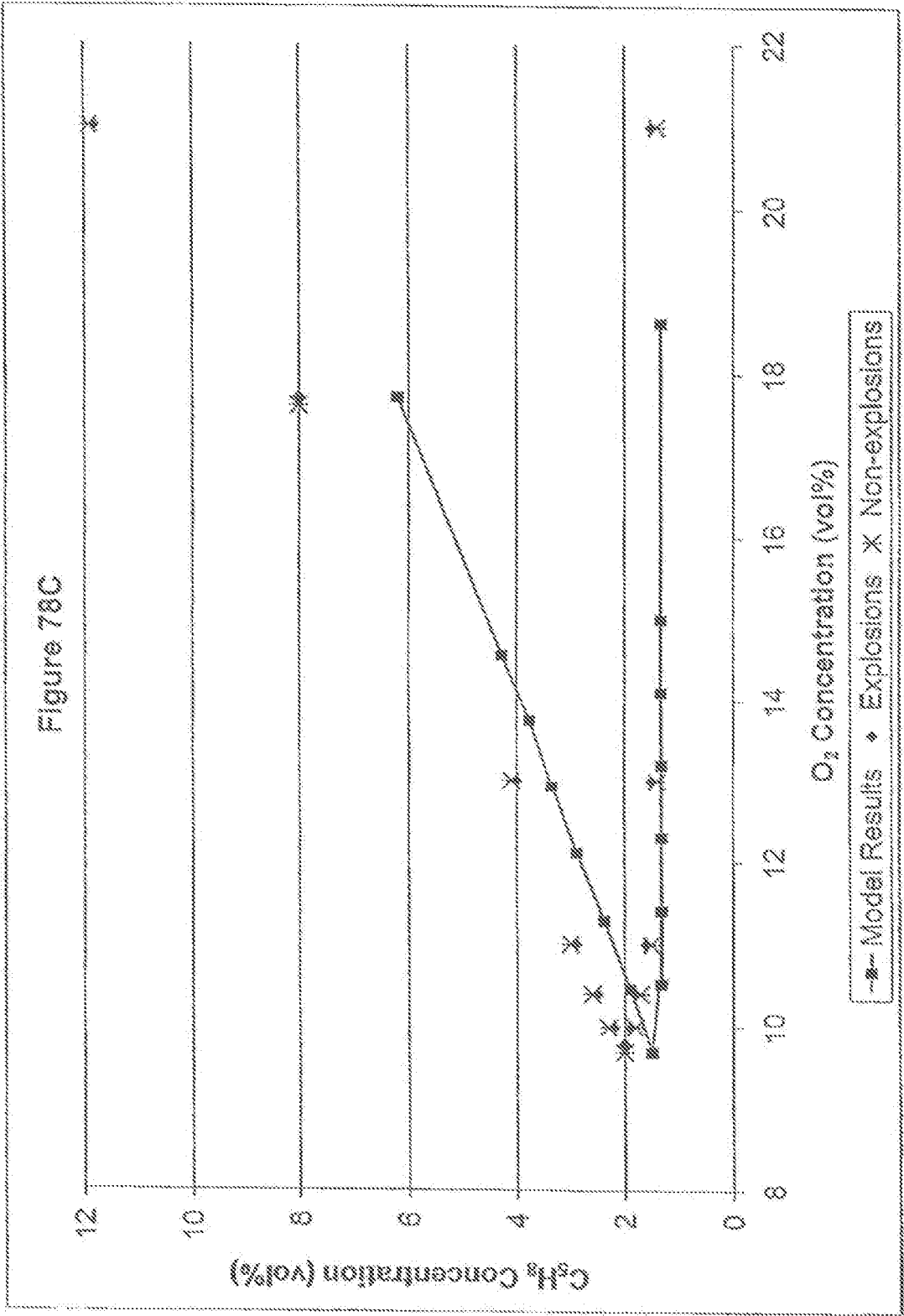


Figure 78B

Explosions		Non-explosions	
O ₂ Concentration (vol. %)	C ₅ H ₈ Concentration (vol. %)	O ₂ Concentration (vol. %)	C ₅ H ₈ Concentration (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



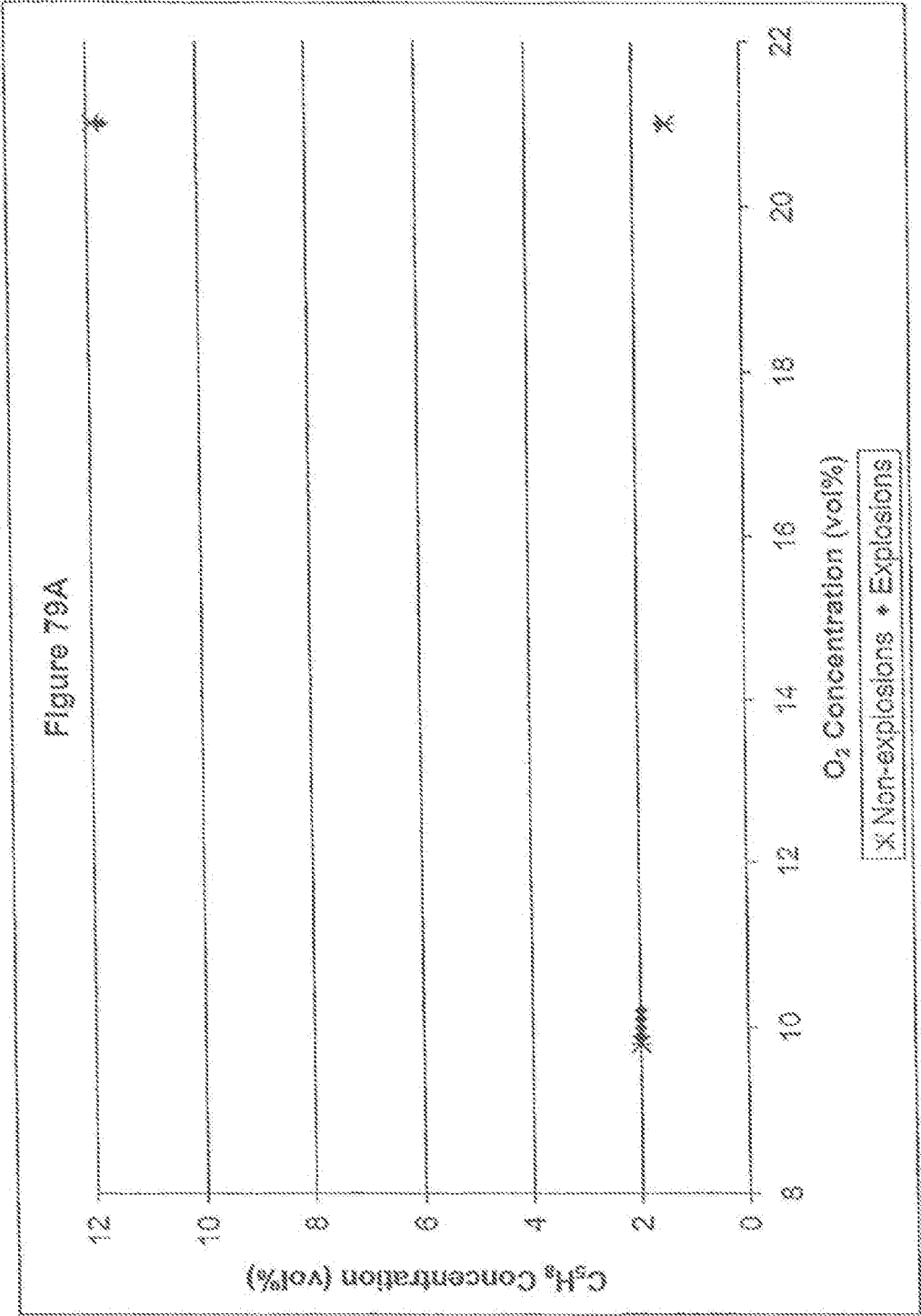


Figure 79B

Explosions		Non-explosions	
O ₂ Concentration (vol. %)	C ₅ H ₈ Concentration (vol. %)	O ₂ Concentration (vol. %)	C ₅ H ₈ Concentration (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 79C

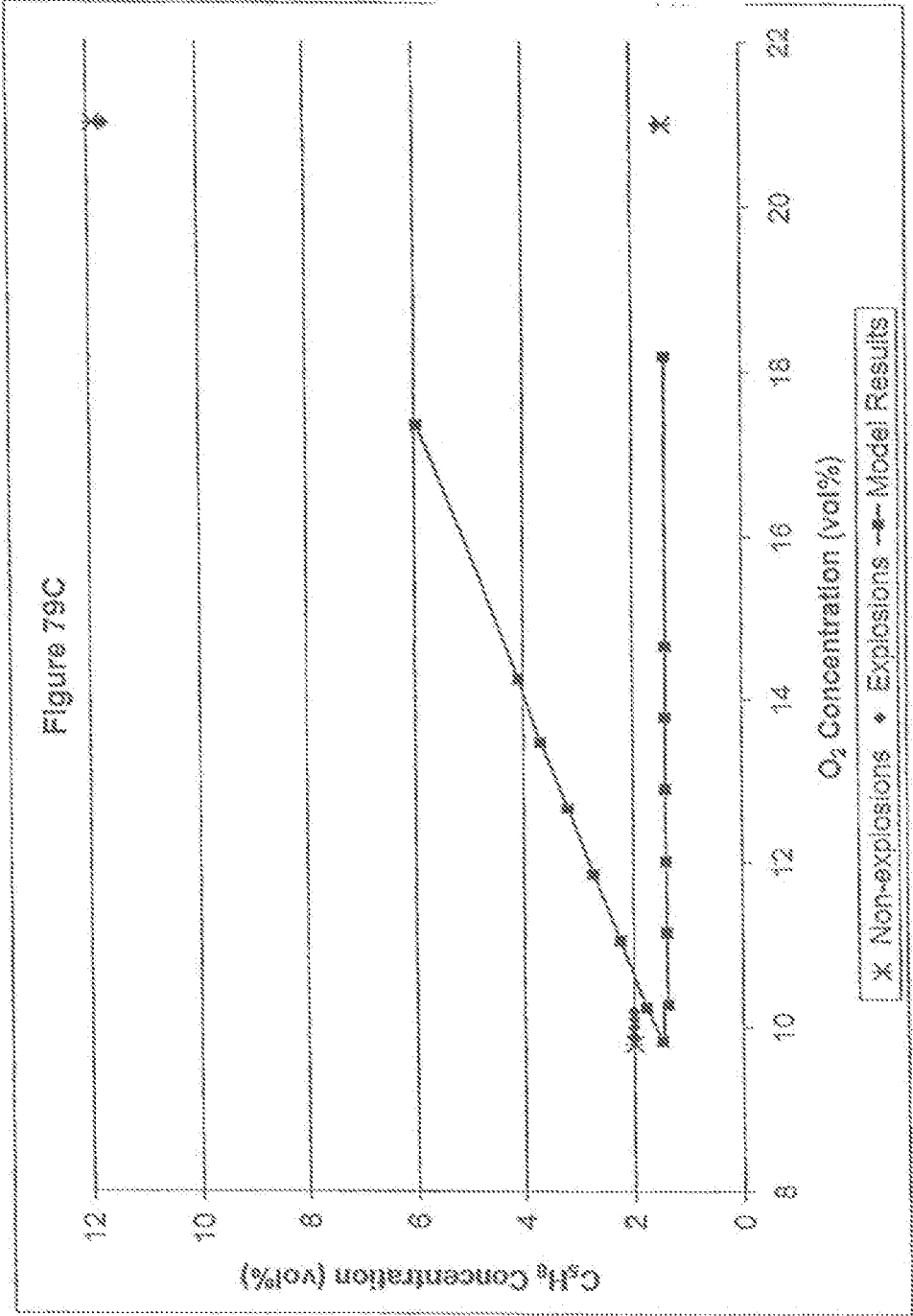


Figure 80A

TEST SERIES 1

Test	Data File Name	Temp °C	Initial Pressure bara	Partial Pressures			Concentrations			Result	P _{ex} bara
				C ₆ H ₆ mbar	N ₂ mbar	O ₂ mbar	C ₆ 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	16	785	214	1.8	77.2	21.0	Explosion	5.47
7	T11120706	40	1.014	15	786	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	1.28
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	1.06
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	883	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	1.08
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 ₅ H ₈ mbar	N ₂ mbar	O ₂ mbar	C ₅ H ₈ 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	3.0	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	885	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	15	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	896	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	1.09
73	T11140728	40	1.014	20	895	99	2.0	88.3	9.8	Explosion	1.1
74	T11140729	40	1.014	20	896	96	2.0	88.4	9.7	Non-Explosion	1.06
75	T11140730	40	1.014	20	896	96	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	781	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	1.3
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 ₃ H ₈ mbar	N ₂ mbar	O ₂ mbar	H ₂ O vol. %	C ₃ H ₈ vol. %	N ₂ vol. %	O ₂ vol. %		
1	T11150700	40	1.014	41	119	641	213	4.0	11.7	63.2	21.0	Explosion	1.33
2	T11150701	40	1.014	40	121	640	213	3.9	11.9	63.1	21.0	Non-explosion	1.07
3	T11150702	40	1.014	41	120	640	213	4.0	11.8	63.1	21.0	Explosion	1.09
4	T11150703	40	1.014	40	121	640	213	3.9	11.9	63.1	21.0	Non-explosion	1.06
5	T11150704	40	1.014	40	120	641	213	3.9	11.8	63.2	21.0	Explosion	1.09
6	T11150705	40	1.014	40	121	640	213	3.9	11.9	63.1	21.0	Non-explosion	1.06
7	T11150706	40	1.014	40	15	746	213	3.9	1.5	73.5	21.0	Explosion	4.68
8	T11150707	40	1.014	41	16	745	213	4.0	1.5	73.5	21.0	Explosion	5.27
9	T11150708	40	1.014	41	14	746	213	4.0	1.4	73.5	21.0	Non-explosion	1.03
10	T11150709	40	1.014	42	14	745	213	4.1	1.4	73.5	21.0	Non-explosion	1.03
11	T11150700	40	1.014	41	14	746	213	4.0	1.4	73.5	21.0	Non-explosion	1.03
12	T11150701	40	1.014	41	20	850	103	4.0	2.0	83.8	10.2	Explosion	1.11
13	T11150702	40	1.014	41	20	851	102	4.0	2.0	83.9	10.1	Explosion	1.11
14	T11150703	40	1.014	41	20	852	101	4.0	2.0	84.0	10.0	Explosion	1.09
15	T11150704	40	1.014	41	20	853	100	4.0	2.0	84.1	9.9	Explosion	1.09
16	T11150705	40	1.014	41	20	854	99	4.0	2.0	84.2	9.8	Non-explosion	1.07
17	T11150706	40	1.014	40	20	855	99	3.9	2.0	84.3	9.8	Non-explosion	1.06
18	T11150707	40	1.014	41	20	854	99	4.0	2.0	84.2	9.8	Non-explosion	1.08

Figure 82

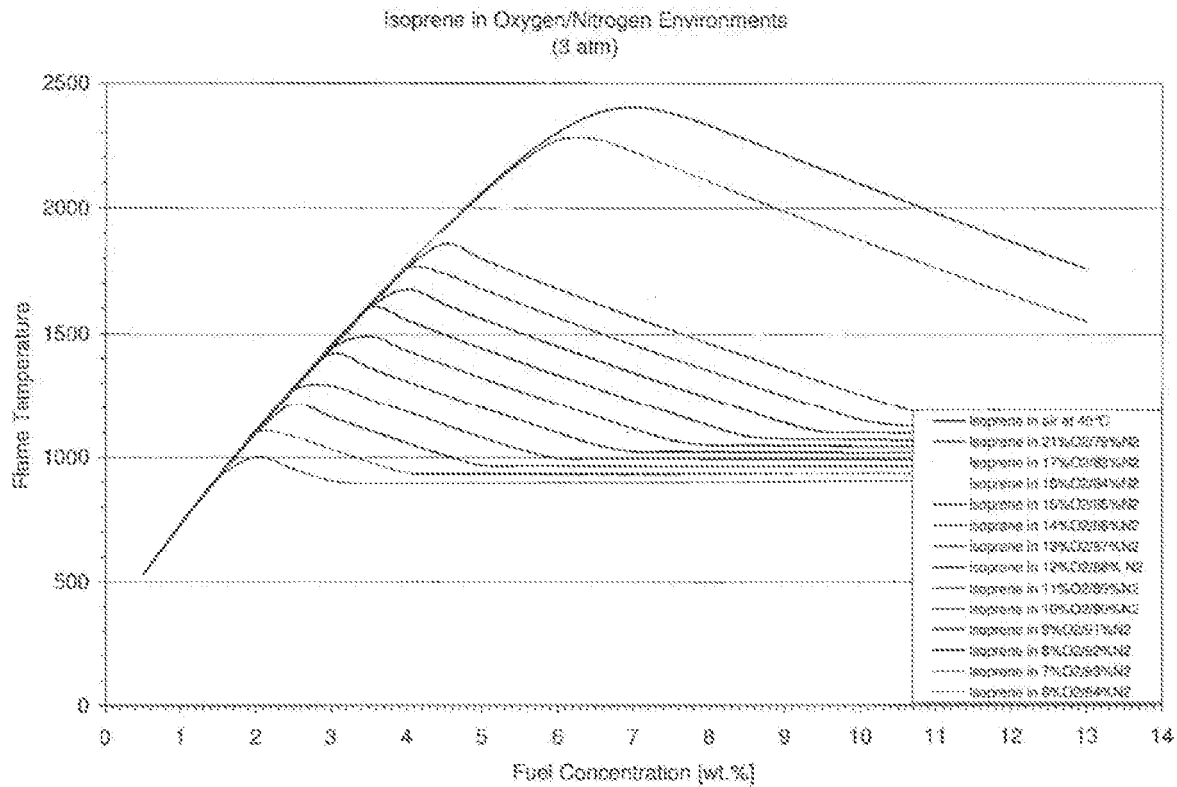


Figure 83

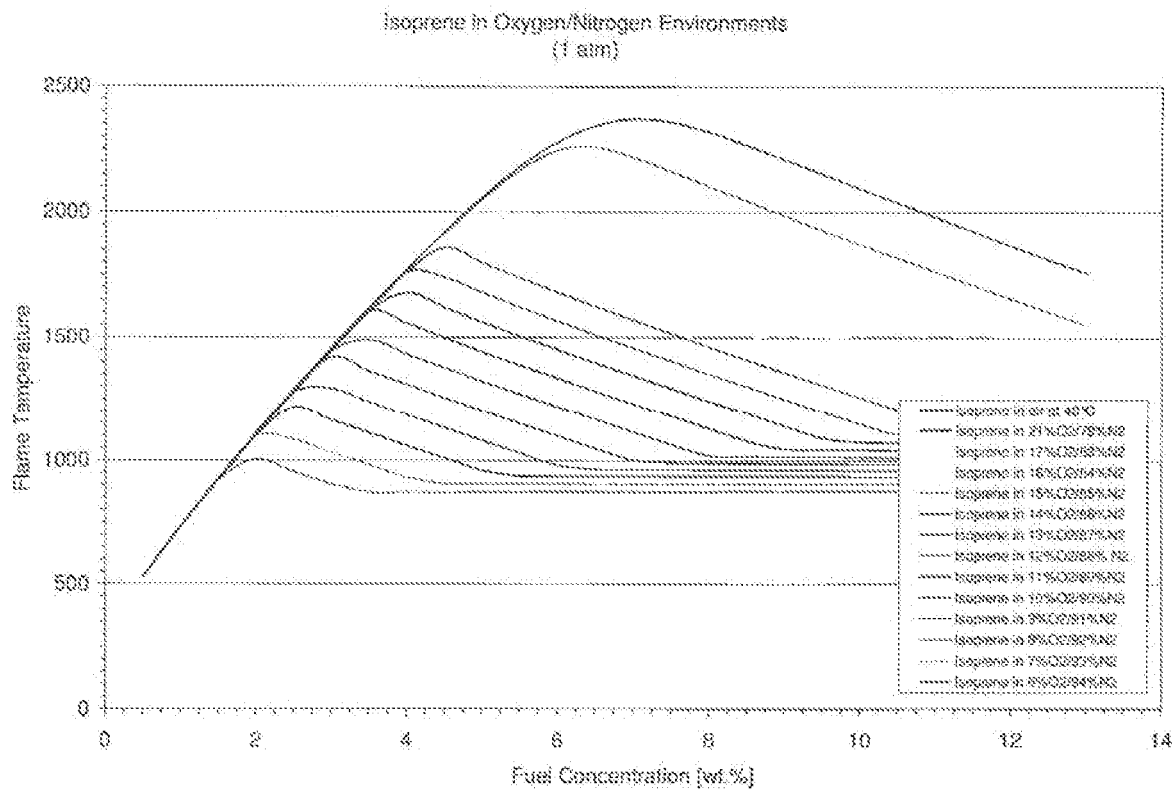


Figure 84

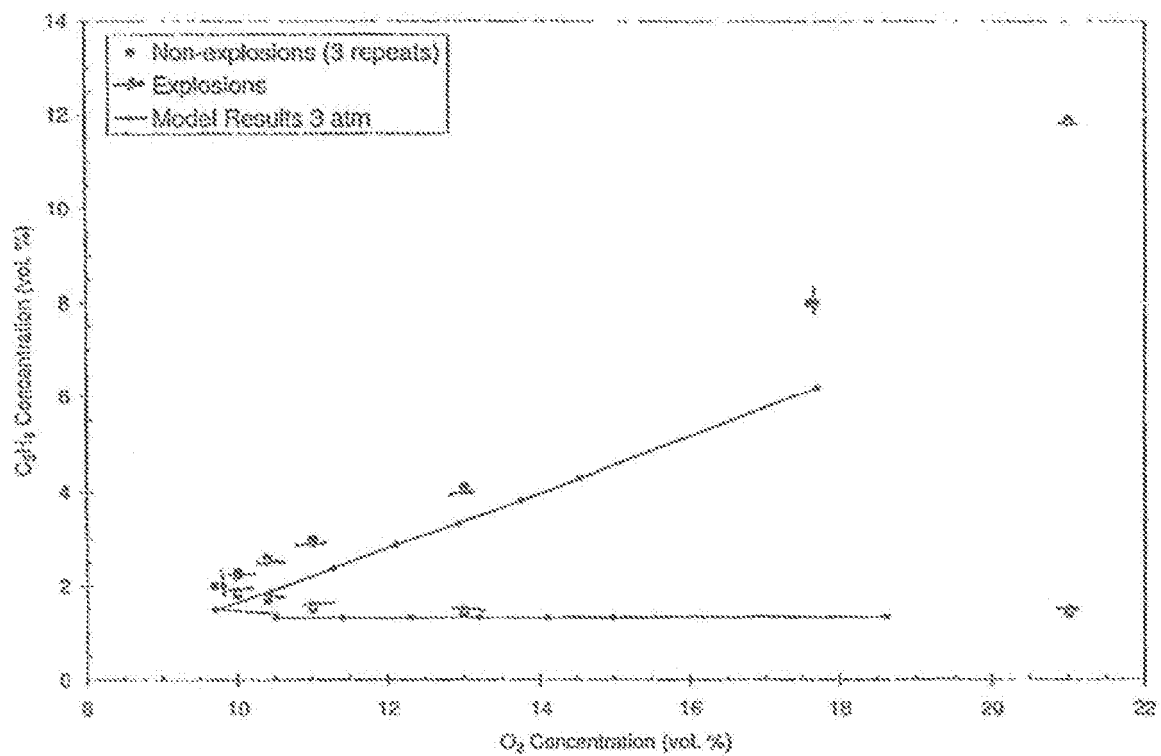


Figure 85

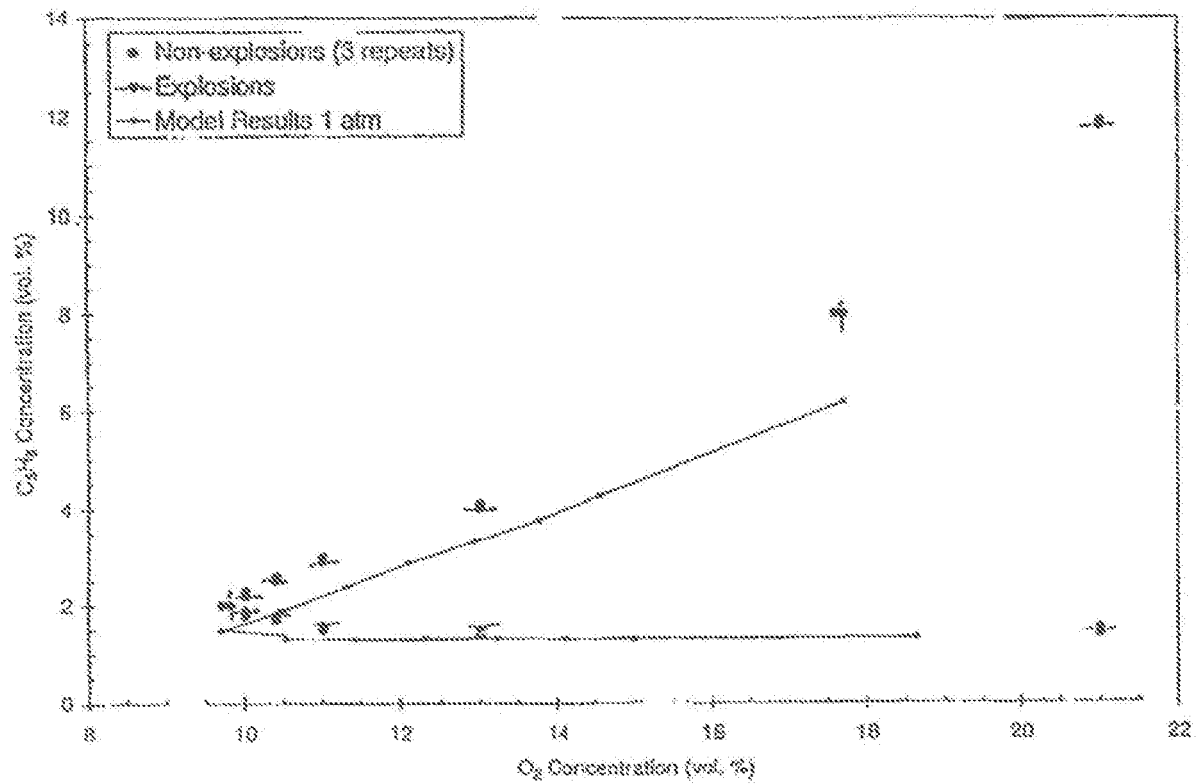


Figure 86A

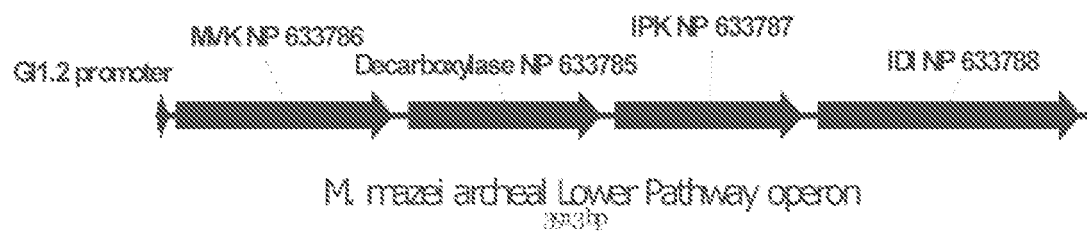


Figure 86C

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(SEQ ID NO:102)

Figure 87A

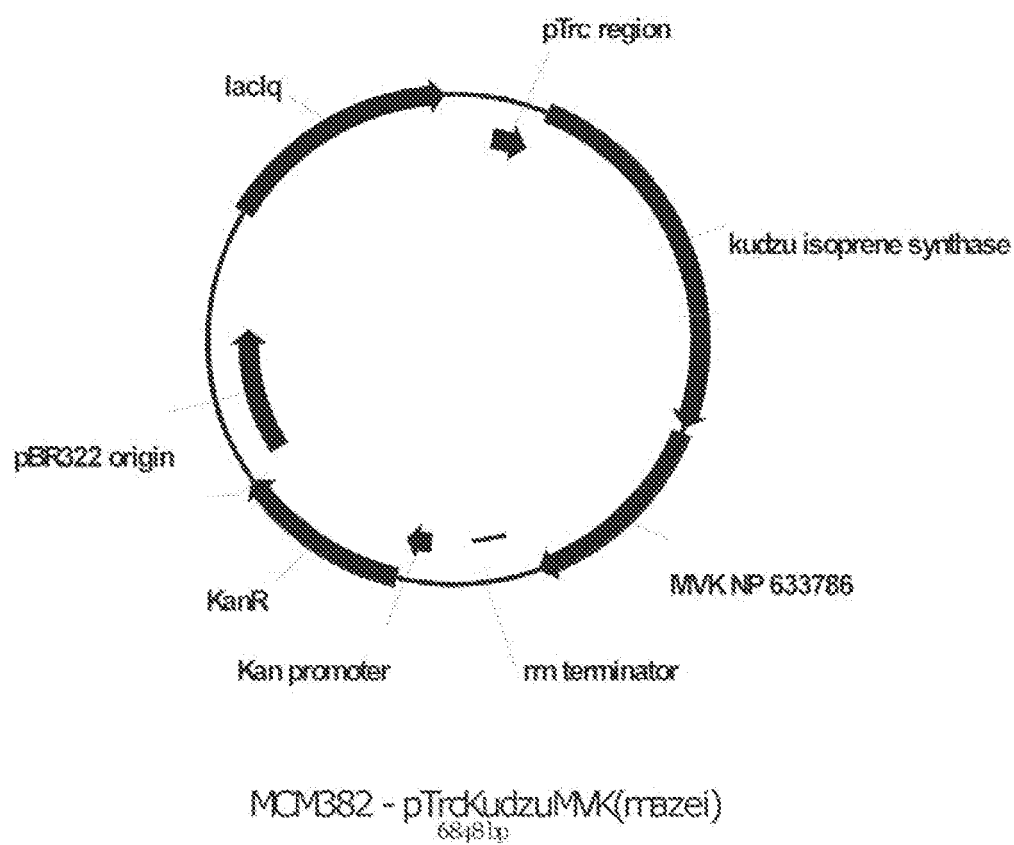
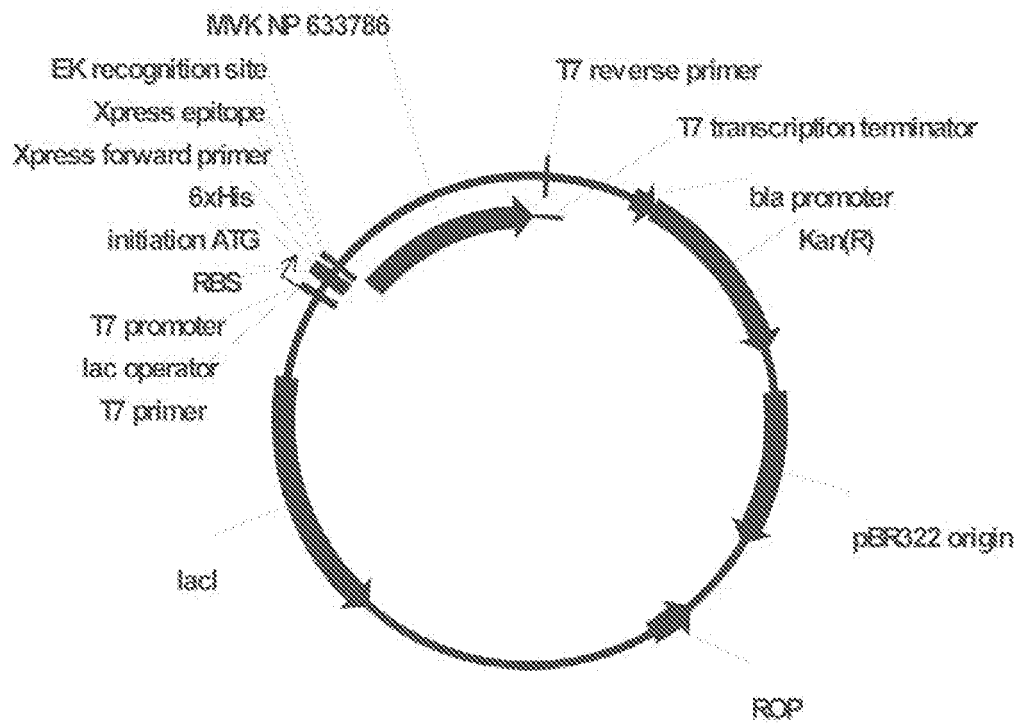


Figure 88A



MVK376 - MVK from *M. mazei* archeal Lowerin pET200D
6647 bp

Figure 88B

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Figure 88C

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Figure 89A

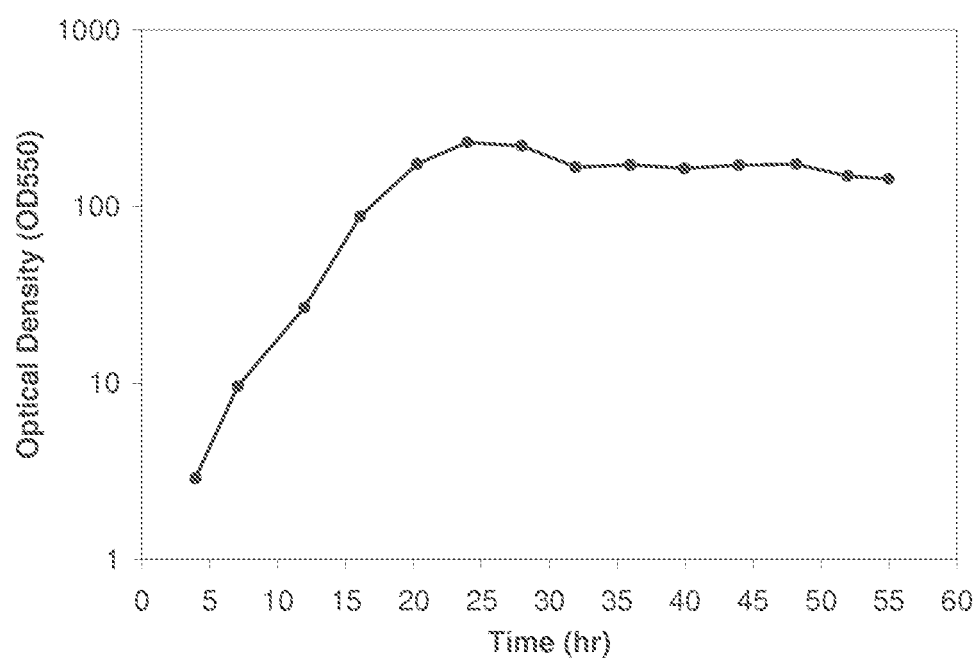


Figure 89B

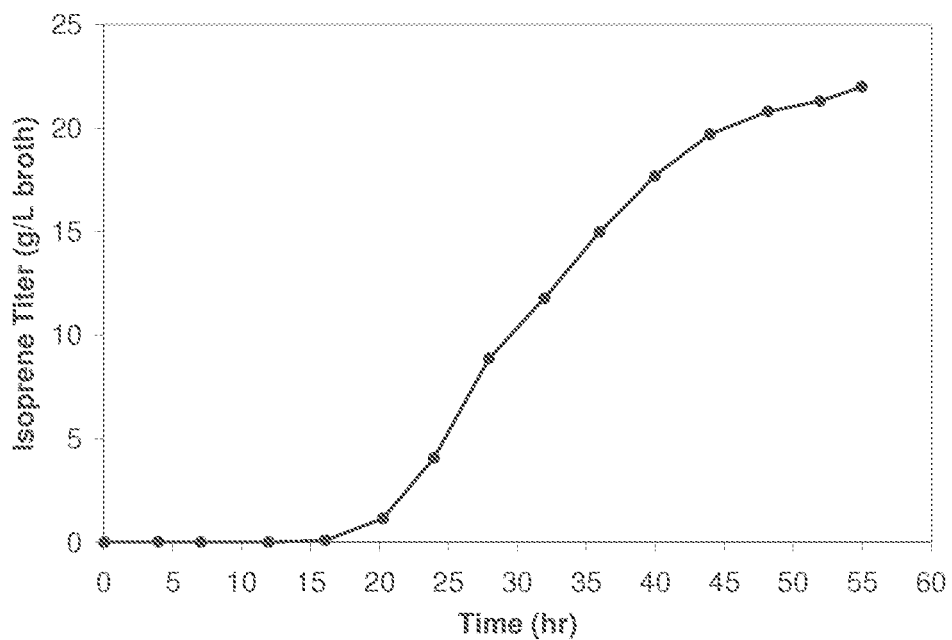


Figure 89C

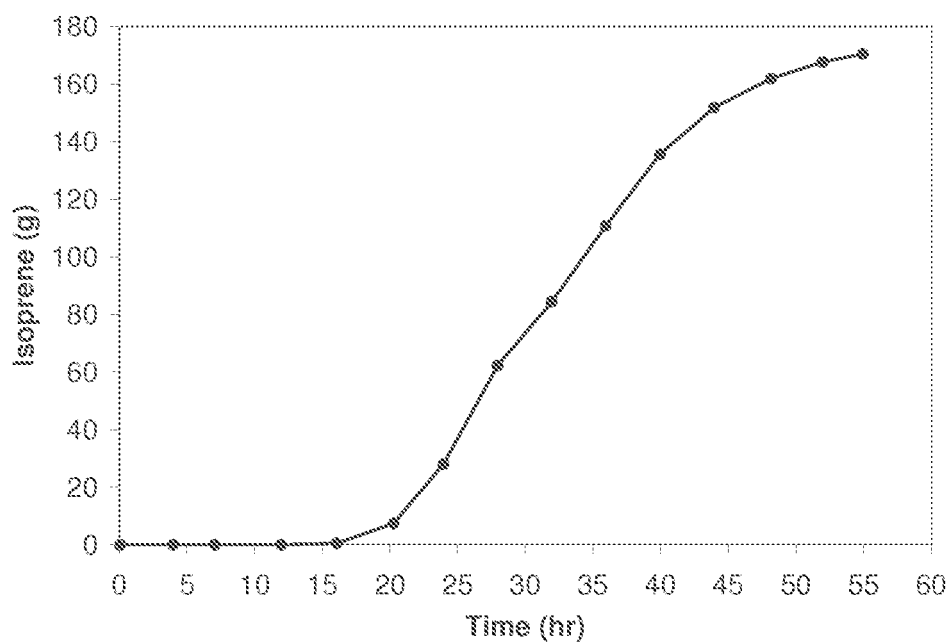
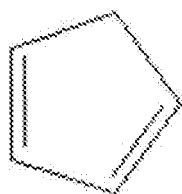
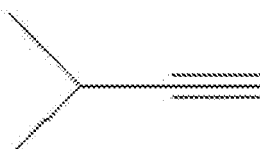


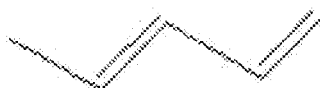
Figure 90



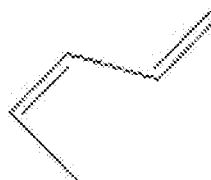
cyclopentadiene



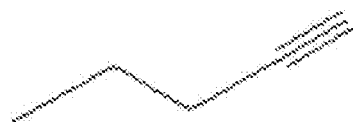
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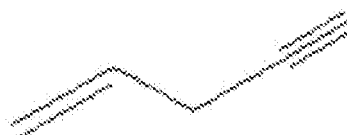
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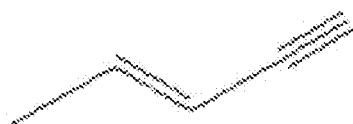
cis-piperylene



1-pentyne



pent-4-ene-1-yne



trans-pent-3-ene-1-yne



cis-pent-3-ene-1-yne

Figure 91

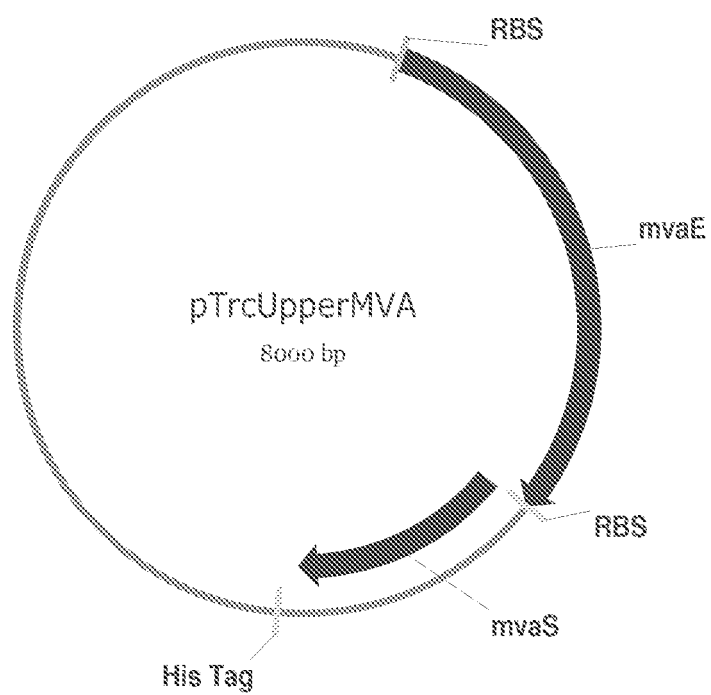


Figure 92A

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Figure 92B

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Figure 92C

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Figure 93

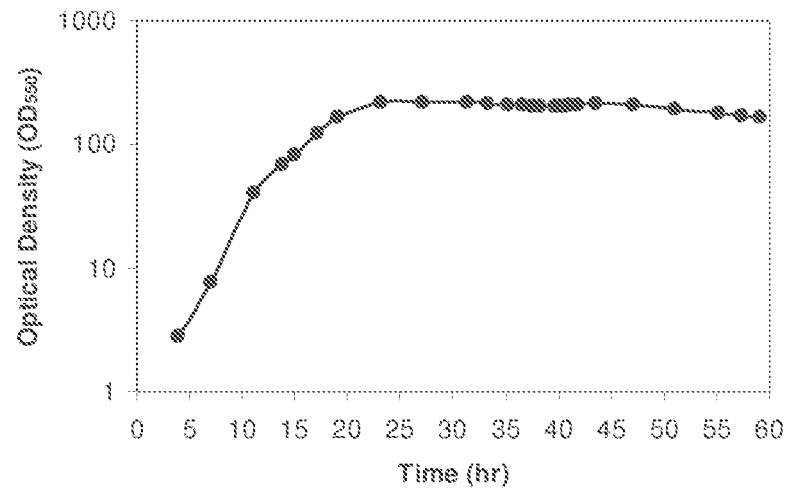


Figure 94

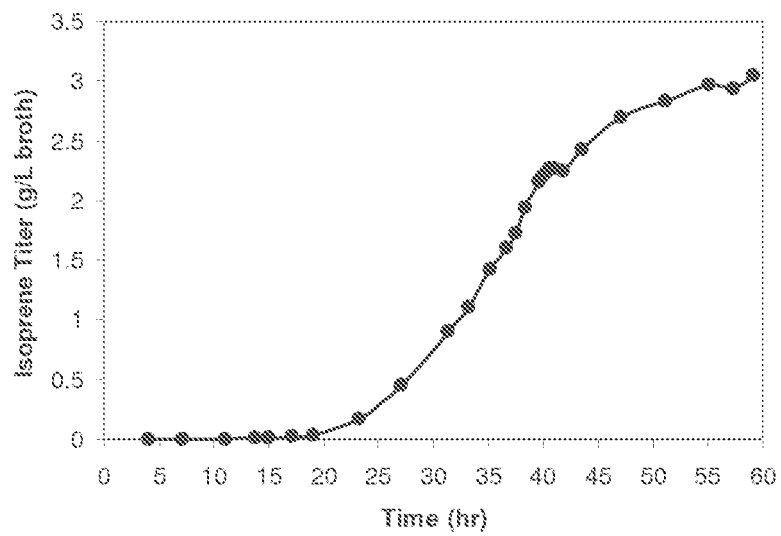


Figure 95

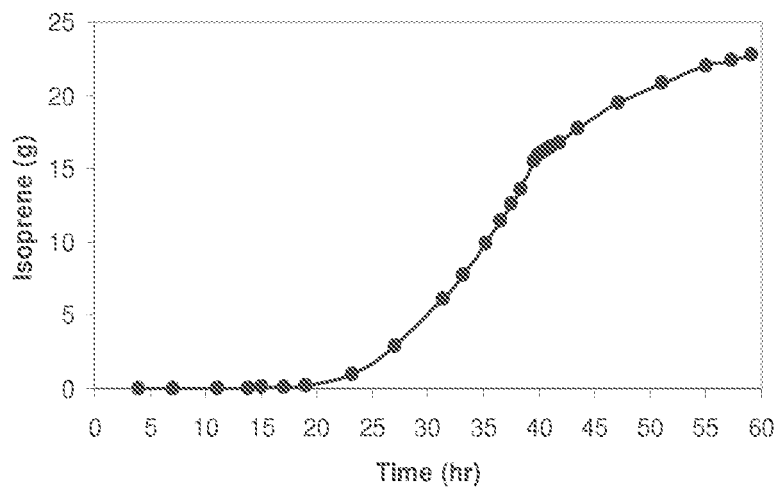


Figure 96

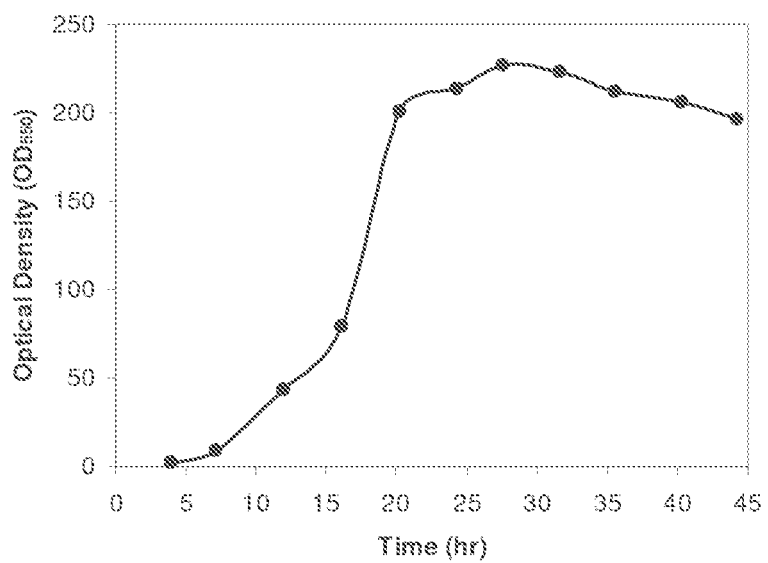


Figure 97

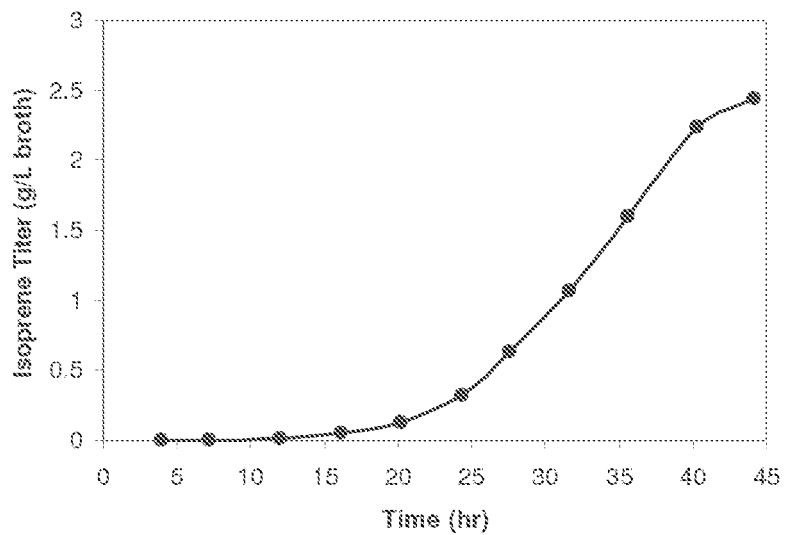


Figure 98

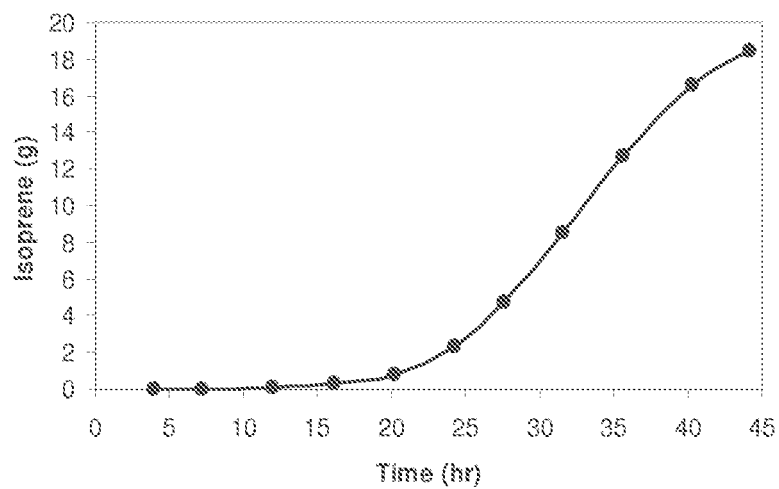


Figure 99

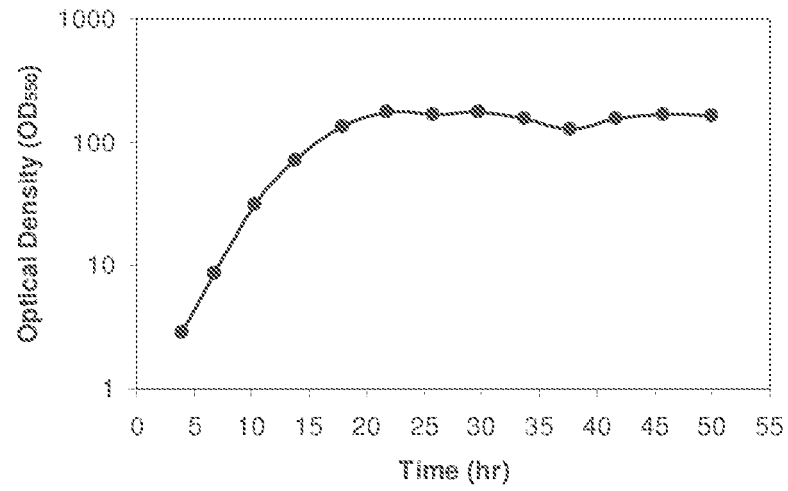


Figure 100

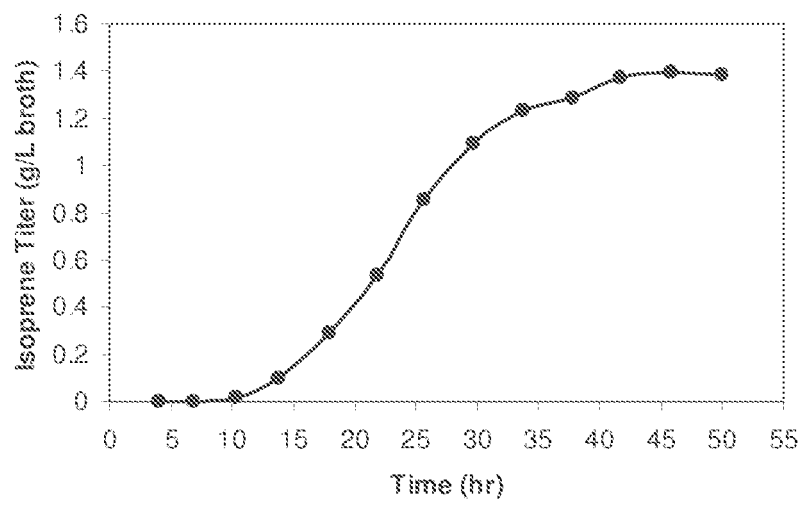


Figure 101

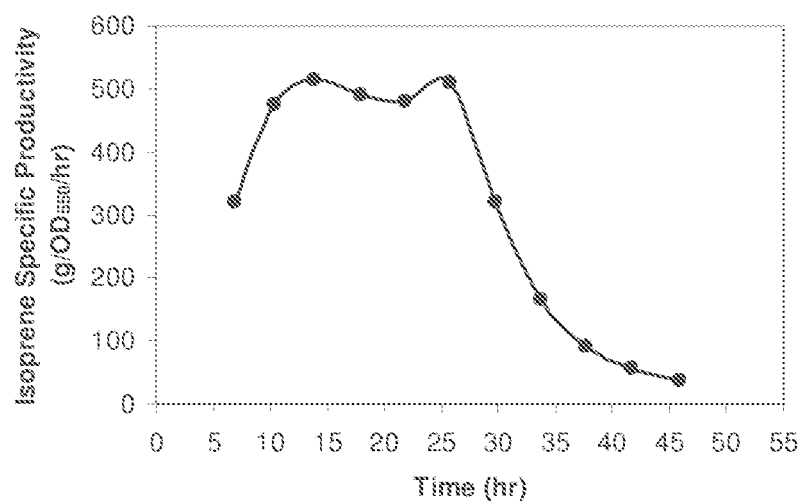


Figure 102

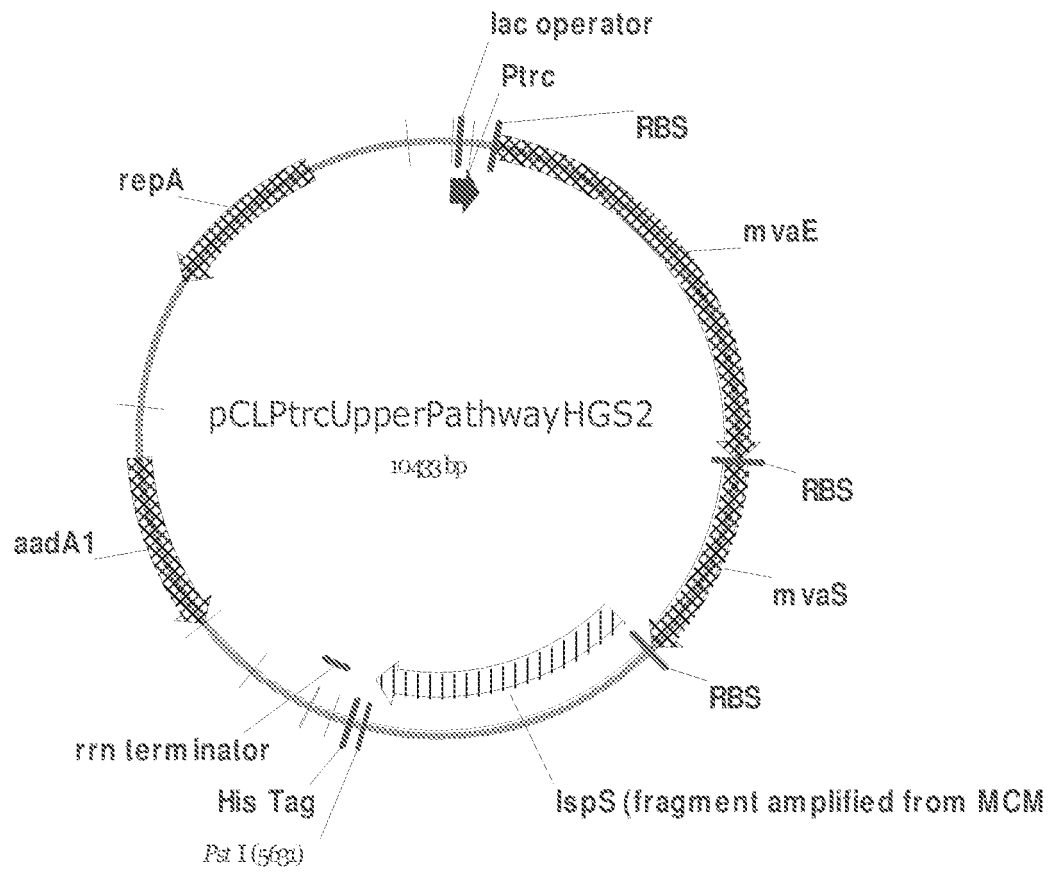


Figure 103A

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Figure 104

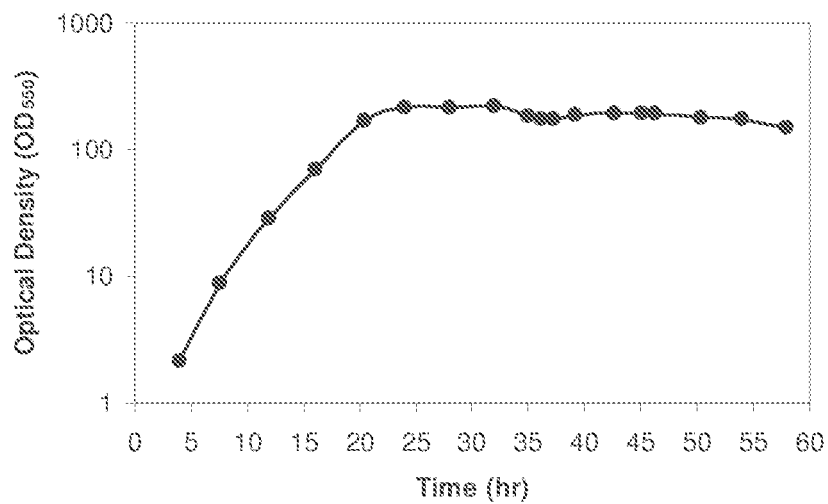


Figure 105

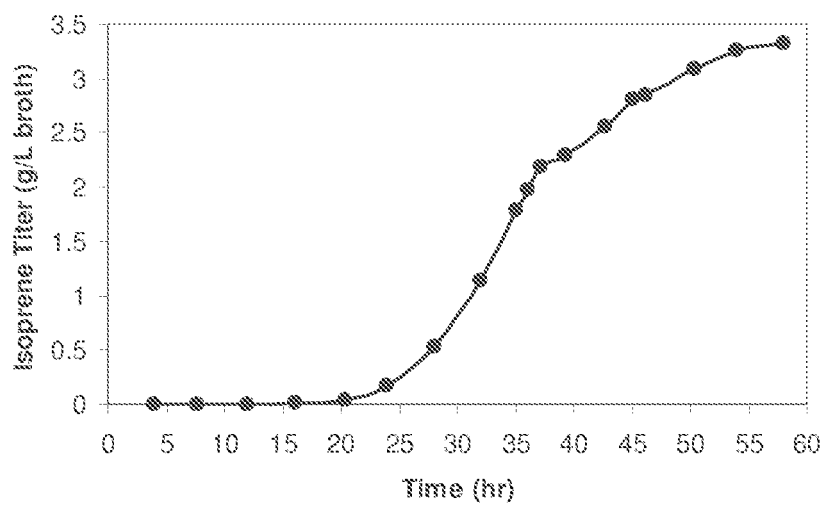


Figure 106

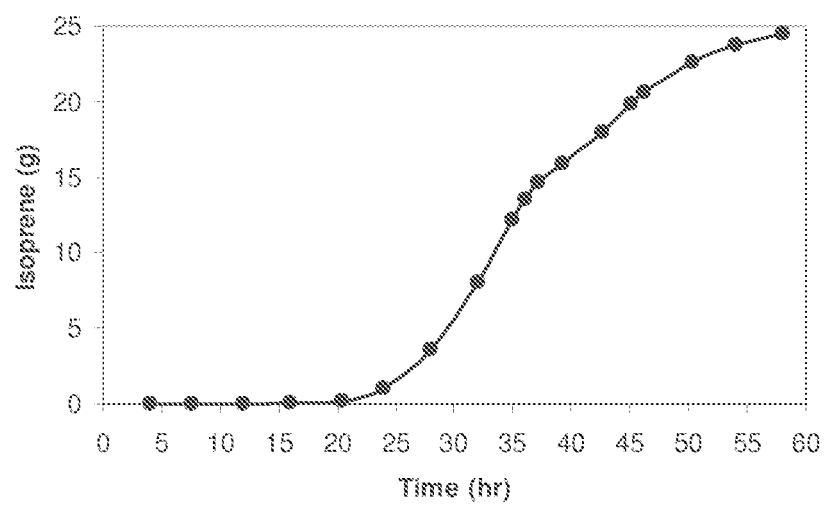
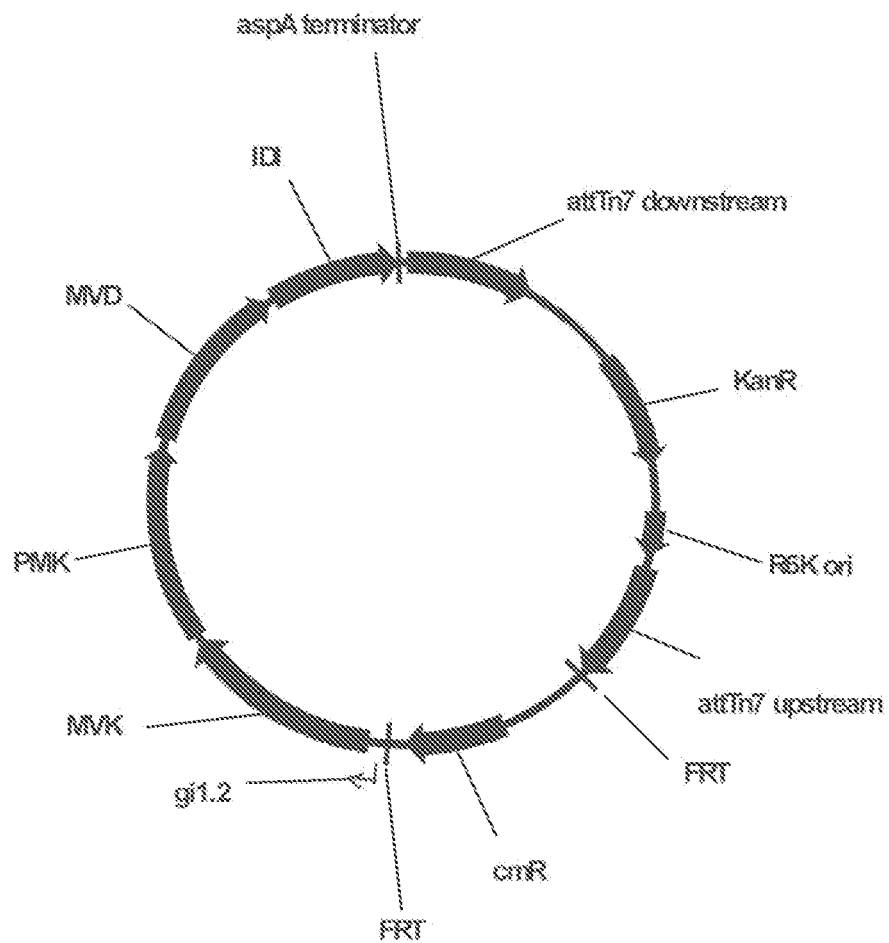


Figure 107



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1076 bp

Figure 108A

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Figure 108C

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Figure 109

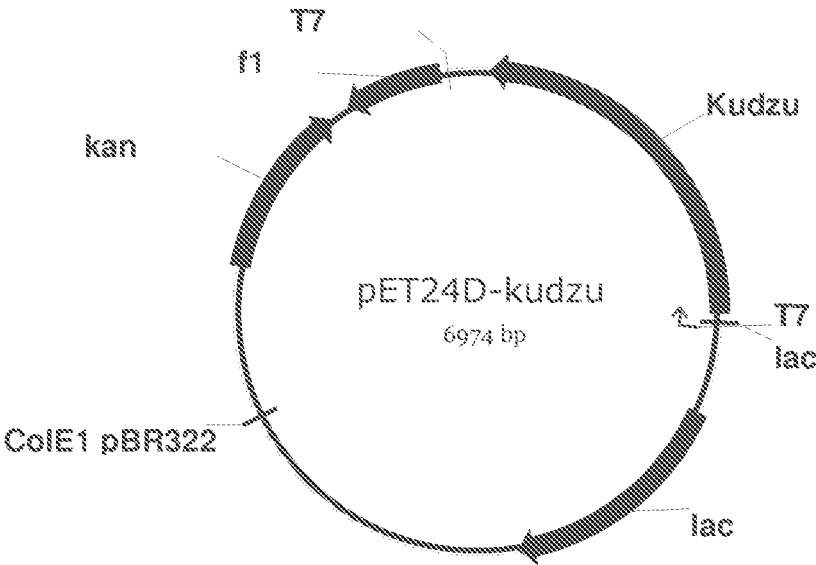


Figure 110A

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Figure 111A

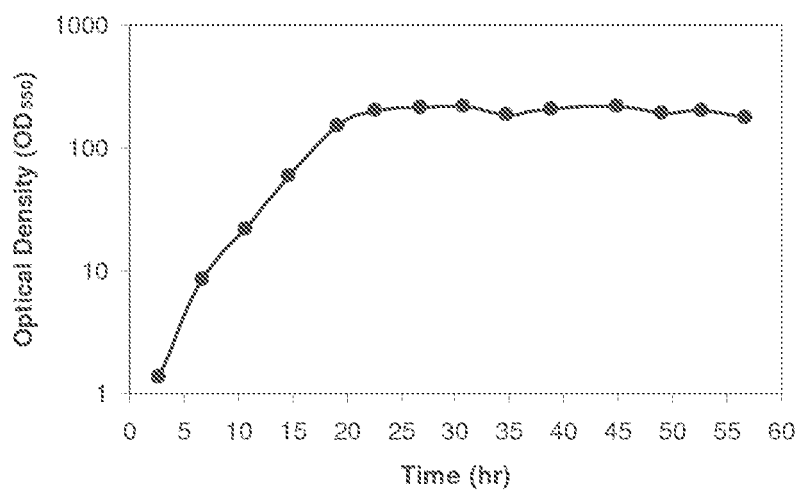


Figure 111B

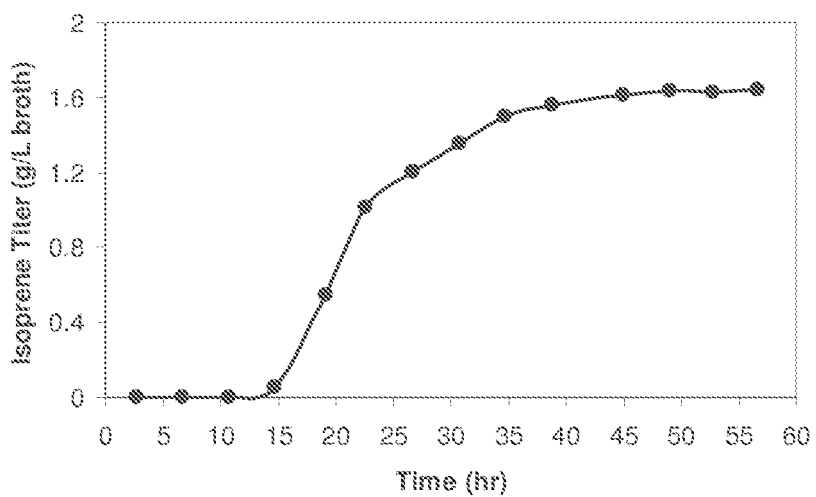


Figure 111C

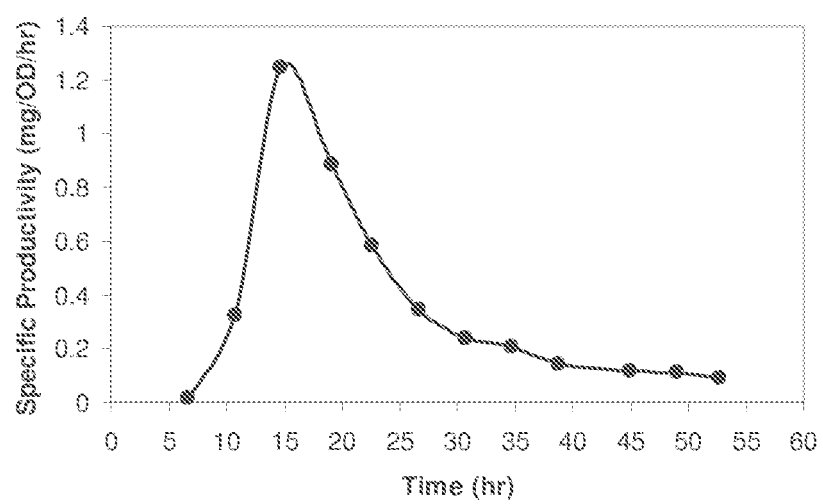


Figure 112

