





230073817094, 0.06710423073817094), (2.1895876615348227e-06, 2.1895876615348227e-06), (1065.381191469127, 1065.381191469127), (1634912744.490322, 1634912744.490322), (14520.998594483866, 14520.998594483866), (1.2857656642374193, 1.2857656642374193), (0.011016712487438105, 0.011016712487438105), (7.228938965214563e-05, 7.228938965214563e-05), (163354.9385852868, 163354.9385852868), (0, None), (0, None), (0, None), (0, None), (1.4826039143168819, 1.4826039143168819)

F\_o 0.000000e+00 1.482604e+00 1.48260

$$1.485e+00j]], \text{ and } y([ -3.871e-01, -3.871e-01,$$

```
message: Optimization terminated successfully.
success: True
status: 0
  fun: 0.38713323163741986
     x: [ 6.710e-02  2.190e-06 ...  7.437e+04  1.483e+00]
    nit: 702
   nfev: 1191
al_simplex: (array([[ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00],
                    [ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00],
                    ...,
                    [ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00],
                    [ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00]]), array([ 3.871e-01,  3.871e-01, ...,  3.871e-01,  3.871e-01]))
```

```
message: Optimization terminated successfully.
success: True
status: 0
  fun: 0.38713323163741986
     x: [ 6.710e-02  2.190e-06 ...  7.437e+04  1.483e+00]
    nit: 702
   nfev: 1191
al_simplex: (array([[ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00],
                    [ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00],
                    ...,
                    [ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00],
                    [ 6.710e-02,  2.190e-06, ...,  7.437e+04,
                     1.483e+00]]), array([ 3.871e-01,  3.871e-01, ...,  3.871e-01,  3.871e-01]))
```























```
Across all four plots:

RSS (converged)=0.772

RSS (initial)=1.578

RSS (% reduction)=0.672

epsilon Initial_guesses Converged
P_b 0.000000e+00 6.710423e-02 6.710423e-02
P_u 0.000000e+00 2.189588e-06 2.189588e-06
K_12 0.000000e+00 1.065381e+03 1.065381e+03
C_pa 0.000000e+00 1.634913e+09 1.634913e+09
A_s 0.000000e+00 1.452100e+04 1.452100e+04
P_r 8.611171e+00 1.285766e+00 9.896937e+00
C_pt -1.101664e-02 1.101671e-02 7.492065e-08
K_t 2.495559e+01 7.228939e-05 2.495566e+01
A_r 5.689233e+09 1.633549e+05 5.689397e+09
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00

message: Maximum number of iterations has been exceeded.
success: False
status: 2
fun: 0.7716768209107951
x: [ 6.710e-02 2.190e-06 ... 9.109e+04 1.483e+00]
nit: 100000
nfev: 134722
final_simplex: (array([[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00],
[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00],
...,
[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00],
[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00]]), array([ 7.717e-01, 7.717e-01, ..., 7.717e-01, 7.717e-01]))
```







Figure 1 consists of two plots. The left plot, titled "inducer -> S -| Output (GFP)", shows the relationship between inducer concentration (x-axis, log scale from  $10^{-5}$  to  $10^{-1}$ ) and GFP output (y-axis, log scale from  $10^3$  to  $10^4$ ). The data points (purple dots) show a sigmoidal decrease in GFP output as inducer concentration increases. The right plot, titled "Full circuit with stripe", shows the relationship between inducer concentration (x-axis, log scale from  $10^{-5}$  to  $10^{-1}$ ) and GFP output (y-axis, linear scale from  $3 \times 10^3$  to  $6 \times 10^3$ ). Two curves are shown: a black curve and a green curve. Both curves exhibit a peak at intermediate inducer concentrations, with the black curve peaking higher than the green curve.

Across all four plots:

RSS (converged)=1.096

RSS (initial)=1.965

RSS (% reduction)=0.642

message: Maximum number of iterations has been exceeded.  
success: False  
status: 2

	epsilon	Initial_guesses	Converged
P_b	0.000000e+00	6.710423e-02	6.710423e-02
P_u	0.000000e+00	2.189588e-06	2.189588e-06
K_12	0.000000e+00	1.065381e+03	1.065381e+03
C_pa	0.000000e+00	1.634913e+09	1.634913e+09
A_s	0.000000e+00	1.452100e+04	1.452100e+04
P_r	9.287453e-02	1.285766e+00	1.378640e+00
C_pt	-1.101648e-02	1.101671e-02	2.306098e-07
K_t	7.355522e+00	7.228939e-05	7.355595e+00
A_r	1.342851e+10	1.633549e+05	1.342867e+10
P_o	0.000000e+00	1.229728e+00	1.229728e+00
C_pl	0.000000e+00	1.247659e-02	1.247659e-02
K_l	0.000000e+00	2.018275e-06	2.018275e-06
A_o	0.000000e+00	9.109492e+04	9.109492e+04
F_o	0.000000e+00	1.482604e+00	1.482604e+00

fun: 1.0956743885535993  
x: [ 6.710e-02 2.190e-06 ... 9.109e+04 1.483e+00]  
nit: 100000  
nfev: 134606  
final\_simplex: (array([[ 6.710e-02, 2.190e-06, ..., 9.109e+04, 1.483e+00],  
[ 6.710e-02, 2.190e-06, ..., 9.109e+04, 1.483e+00],  
...,  
[ 6.710e-02, 2.190e-06, ..., 9.109e+04, 1.483e+00],  
[ 6.710e-02, 2.190e-06, ..., 9.109e+04, 1.483e+00]]), array([ 1.096e+00, 1.096e+00, ..., 1.096e+00, 1.096e+00]))







```
Across all four plots:

RSS (converged)=0.399

RSS (initial)=0.497

RSS (% reduction)=0.555

epsilon Initial_guesses Converged
P_b 0.000000e+00 6.710423e-02 6.710423e-02
P_u 0.000000e+00 2.189588e-06 2.189588e-06
K_12 0.000000e+00 1.065381e+03 1.065381e+03
C_pa 0.000000e+00 1.634913e+09 1.634913e+09
A_s 0.000000e+00 1.452100e+04 1.452100e+04
P_r -2.313744e-01 1.285766e+00 1.054391e+00
C_pt -1.101642e-02 1.101671e-02 2.919524e-07
K_t 3.979317e+00 7.228939e-05 3.979390e+00
A_r 9.270990e+09 1.633549e+05 9.271154e+09
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00

message: Maximum number of iterations has been exceeded.
success: False
status: 2
fun: 0.3985038247268988
x: [ 6.710e-02 2.190e-06 ... 9.109e+04 1.483e+00]
nit: 100000
nfev: 134825
final_simplex: (array([[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00],
[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00],
...,
[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00],
[ 6.710e-02, 2.190e-06, ..., 9.109e+04,
1.483e+00]]), array([ 3.985e-01, 3.985e-01, ..., 3.985e-01, 3.985e-01]))
```



```
Across all four plots:

RSS (converged)=0.13

RSS (initial)=0.392

RSS (% reduction)=0.75

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.13026966446199742
x: [ 1.281e-01  2.773e-06 ...  9.109e+04  1.483e+00]
nit: 613
nfev: 1256
final_simplex: (array([[ 1.281e-01,  2.773e-06, ...,  9.109e+04,
                        1.483e+00],
                        [ 1.281e-01,  2.773e-06, ...,  9.109e+04,
                        1.483e+00],
                        ...,
                        [ 1.281e-01,  2.773e-06, ...,  9.109e+04,
                        1.483e+00],
                        [ 1.281e-01,  2.773e-06, ...,  9.109e+04,
                        1.483e+00]]), array([ 1.303e-01,  1.303e-01, ...,  1.303e-01,  1.303e-01]))

epsilon Initial_guesses Converged
P_b 6.096092e-02 6.710423e-02 1.280651e-01
P_u 5.834927e-07 2.189588e-06 2.773080e-06
K_12 2.439283e+02 1.065381e+03 1.309310e+03
C_pa 1.266291e+08 1.634913e+09 1.761542e+09
A_s -4.704070e+03 1.452100e+04 9.816929e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00
```

Across all four plots:

RSS (converged)=0.087

RSS (initial)=3.942

RSS (% reduction)=0.979

message: Optimization terminated successfully.  
success: True  
status: 0

	epsilon	Initial_guesses	Converged
P_b	3.194413e-01	6.710423e-02	3.865456e-01
P_u	8.350648e-06	2.189588e-06	1.054024e-05
K_12	-8.426972e+02	1.065381e+03	2.226840e+02
C_pa	1.305707e+09	1.634913e+09	2.940620e+09
A_s	-1.106887e+04	1.452100e+04	3.452129e+03
P_r	0.000000e+00	1.285766e+00	1.285766e+00
C_pt	0.000000e+00	1.101671e-02	1.101671e-02
K_t	0.000000e+00	7.228939e-05	7.228939e-05
A_r	0.000000e+00	1.633549e+05	1.633549e+05
P_o	0.000000e+00	1.229728e+00	1.229728e+00
C_pl	0.000000e+00	1.247659e-02	1.247659e-02
K_l	0.000000e+00	2.018275e-06	2.018275e-06
A_o	0.000000e+00	9.109492e+04	9.109492e+04
F_o	0.000000e+00	1.482604e+00	1.482604e+00

fun: 0.08651068620269821  
x: [ 3.865e-01 1.054e-05 ... 9.109e+04 1.483e+00]  
nit: 797  
nfev: 1515  
final\_simplex: (array([[ 3.865e-01, 1.054e-05, ..., 9.109e+04, 1.483e+00],  
[ 3.865e-01, 1.054e-05, ..., 9.109e+04, 1.483e+00],  
...,  
[ 3.865e-01, 1.054e-05, ..., 9.109e+04, 1.483e+00],  
[ 3.865e-01, 1.054e-05, ..., 9.109e+04, 1.483e+00]]), array([ 8.651e-02, 8.651e-02, ..., 8.651e-02, 8.651e-02]))

```

message: Optimization terminated successfully.
success: True
status: 0
  fun: 0.2891601746493323
     x: [ 6.789e-02  2.689e-06 ...  9.109e+04  1.483e+00]
     nit: 585
     nfev: 1222
     nl_simplex: (array([[ 6.789e-02,  2.689e-06, ...,  9.109e+04,
                          1.483e+00],
                        [ 6.789e-02,  2.689e-06, ...,  9.109e+04,
                          1.483e+00]],
                        ...,
                        [ 6.789e-02,  2.689e-06, ...,  9.109e+04,
                          1.483e+00],
                        [ 6.789e-02,  2.689e-06, ...,  9.109e+04,
                          1.483e+00]]), array([ 2.892e-01,  2.892e-01, ...,  2.892e-01,  2.892e-01]))

```



```
Across all four plots:

RSS (converged)=0.283

RSS (initial)=4.881

RSS (% reduction)=0.945

message: Optimization terminated successfully.
success: True
status: 0
epsilon Initial_guesses Converged
P_b 6.426573e-01 6.710423e-02 7.097615e-01
P_u 4.367053e-06 2.189588e-06 6.556641e-06
K_12 3.814153e+02 1.065381e+03 1.446797e+03
C_pa -6.415724e+08 1.634913e+09 9.933403e+08
A_s -1.149891e+04 1.452100e+04 3.022085e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00

fun: 0.28271930602613404
x: [ 7.098e-01 6.557e-06 ... 9.109e+04 1.483e+00]
nit: 880
nfev: 1621
final_simplex: (array([[ 7.098e-01, 6.557e-06, ..., 9.109e+04,
1.483e+00],
[ 7.098e-01, 6.557e-06, ..., 9.109e+04,
1.483e+00],
...,
[ 7.098e-01, 6.557e-06, ..., 9.109e+04,
1.483e+00],
[ 7.098e-01, 6.557e-06, ..., 9.109e+04,
1.483e+00]]), array([ 2.827e-01, 2.827e-01, ..., 2.827e-01, 2.827e-01]))
```

```
Across all four plots:

RSS (converged)=0.108

RSS (initial)=0.912

RSS (% reduction)=0.895

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.10752235240307195
x: [ 1.609e-01  2.576e-06 ...  9.109e+04  1.483e+00]
nit: 705
nfev: 1380
final_simplex: (array([[ 1.609e-01,  2.576e-06, ...,  9.109e+04,
                          1.483e+00],
                        [ 1.609e-01,  2.576e-06, ...,  9.109e+04,
                          1.483e+00],
                        ...,
                        [ 1.609e-01,  2.576e-06, ...,  9.109e+04,
                          1.483e+00],
                        [ 1.609e-01,  2.576e-06, ...,  9.109e+04,
                          1.483e+00]]), array([ 1.075e-01,  1.075e-01, ...,  1.075e-01,  1.075e-01]))

epsilon Initial_guesses Converged
P_b 9.380195e-02 6.710423e-02 1.609062e-01
P_u 3.866452e-07 2.189588e-06 2.576233e-06
K_12 8.206389e+02 1.065381e+03 1.886020e+03
C_pa -5.902856e+08 1.634913e+09 1.044627e+09
A_s -7.118301e+03 1.452100e+04 7.402698e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00
```

```
Across all four plots:

RSS (converged)=0.13

RSS (initial)=2.034

RSS (% reduction)=0.94

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.12990968507029932
x: [ 1.444e-01  2.113e-06 ...  9.109e+04  1.483e+00]
nit: 731
nfev: 1425
final_simplex: (array([[ 1.444e-01,  2.113e-06, ...,  9.109e+04,
                        1.483e+00],
                        [ 1.444e-01,  2.113e-06, ...,  9.109e+04,
                        1.483e+00],
                        ...,
                        [ 1.444e-01,  2.113e-06, ...,  9.109e+04,
                        1.483e+00],
                        [ 1.444e-01,  2.113e-06, ...,  9.109e+04,
                        1.483e+00]]), array([ 1.299e-01,  1.299e-01, ...,  1.299e-01,  1.299e-01]))

epsilon Initial_guesses Converged
P_b 7.733991e-02 6.710423e-02 1.444441e-01
P_u -7.673503e-08 2.189588e-06 2.112853e-06
K_12 3.602116e+02 1.065381e+03 1.425593e+03
C_pa 4.052631e+08 1.634913e+09 2.040176e+09
A_s -9.030924e+03 1.452100e+04 5.490074e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00
```

```
Across all four plots:

RSS (converged)=0.164

RSS (initial)=1.645

RSS (% reduction)=0.909

epsilon Initial_guesses Converged
P_b 1.913987e-01 6.710423e-02 2.585029e-01
P_u 1.558443e-06 2.189588e-06 3.748031e-06
K_12 4.223370e-02 1.065381e+03 1.065423e+03
C_pa 3.026038e+08 1.634913e+09 1.937517e+09
A_s -8.856535e+03 1.452100e+04 5.664463e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.16366544681897047
x: [ 2.585e-01 3.748e-06 ... 9.109e+04 1.483e+00]
nit: 730
nfev: 1429
final_simplex: (array([[ 2.585e-01, 3.748e-06, ..., 9.109e+04,
1.483e+00],
[ 2.585e-01, 3.748e-06, ..., 9.109e+04,
1.483e+00],
...,
[ 2.585e-01, 3.748e-06, ..., 9.109e+04,
1.483e+00],
[ 2.585e-01, 3.748e-06, ..., 9.109e+04,
1.483e+00]]), array([ 1.637e-01, 1.637e-01, ..., 1.637e-01, 1.637e-01]))
```

```
Across all four plots:

RSS (converged)=0.194

RSS (initial)=2.062

RSS (% reduction)=0.914

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.1937794376948003
x: [ 2.353e-01  2.880e-06 ...  9.109e+04  1.483e+00]
nit: 795
nfev: 1511
final_simplex: (array([[ 2.353e-01,  2.880e-06, ...,  9.109e+04,
                        1.483e+00],
                        [ 2.353e-01,  2.880e-06, ...,  9.109e+04,
                        1.483e+00],
                        ...,
                        [ 2.353e-01,  2.880e-06, ...,  9.109e+04,
                        1.483e+00],
                        [ 2.353e-01,  2.880e-06, ...,  9.109e+04,
                        1.483e+00]]), array([ 1.938e-01,  1.938e-01, ...,  1.938e-01,  1.938e-01]))

epsilon Initial_guesses Converged
P_b 1.681926e-01 6.710423e-02 2.352969e-01
P_u 6.900439e-07 2.189588e-06 2.879632e-06
K_12 8.117037e+02 1.065381e+03 1.877085e+03
C_pa 4.411275e+08 1.634913e+09 2.076040e+09
A_s -9.575103e+03 1.452100e+04 4.945896e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00
```



```
Across all four plots:

RSS (converged)=0.116

RSS (initial)=1.512

RSS (% reduction)=0.929

message: Optimization terminated successfully.
success: True
status: 0
epsilon Initial_guesses Converged
P_b 1.774262e-01 6.710423e-02 2.445305e-01
P_u 7.096367e-07 2.189588e-06 2.899224e-06
K_12 -1.867998e+02 1.065381e+03 8.785814e+02
C_pa -1.038164e+08 1.634913e+09 1.531096e+09
A_s -8.370963e+03 1.452100e+04 6.150036e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00

fun: 0.11598099156514029
x: [ 2.445e-01 2.899e-06 ... 9.109e+04 1.483e+00]
nit: 707
nfev: 1396
final_simplex: (array([[ 2.445e-01, 2.899e-06, ..., 9.109e+04,
1.483e+00],
[ 2.445e-01, 2.899e-06, ..., 9.109e+04,
1.483e+00],
...,
[ 2.445e-01, 2.899e-06, ..., 9.109e+04,
1.483e+00],
[ 2.445e-01, 2.899e-06, ..., 9.109e+04,
1.483e+00]]), array([ 1.160e-01, 1.160e-01, ..., 1.160e-01, 1.160e-01]))
```

```
Across all four plots:

RSS (converged)=0.231

RSS (initial)=2.367

RSS (% reduction)=0.911

message: Optimization terminated successfully.
success: True
status: 0
fun: 0.2312743361211981
x: [ 1.929e-01  2.253e-06 ...  9.109e+04  1.483e+00]
nit: 754
nfev: 1481
final_simplex: (array([[ 1.929e-01,  2.253e-06, ...,  9.109e+04,
                          1.483e+00],
                        [ 1.929e-01,  2.253e-06, ...,  9.109e+04,
                          1.483e+00],
                        ...,
                        [ 1.929e-01,  2.253e-06, ...,  9.109e+04,
                          1.483e+00],
                        [ 1.929e-01,  2.253e-06, ...,  9.109e+04,
                          1.483e+00]]), array([ 2.313e-01,  2.313e-01, ...,  2.313e-01,  2.313e-01]))

epsilon Initial_guesses Converged
P_b 1.258089e-01 6.710423e-02 1.929131e-01
P_u 6.377826e-08 2.189588e-06 2.253366e-06
K_12 -2.094310e+02 1.065381e+03 8.559502e+02
C_pa 2.273919e+09 1.634913e+09 3.908832e+09
A_s -9.698412e+03 1.452100e+04 4.822587e+03
P_r 0.000000e+00 1.285766e+00 1.285766e+00
C_pt 0.000000e+00 1.101671e-02 1.101671e-02
K_t 0.000000e+00 7.228939e-05 7.228939e-05
A_r 0.000000e+00 1.633549e+05 1.633549e+05
P_o 0.000000e+00 1.229728e+00 1.229728e+00
C_pl 0.000000e+00 1.247659e-02 1.247659e-02
K_l 0.000000e+00 2.018275e-06 2.018275e-06
A_o 0.000000e+00 9.109492e+04 9.109492e+04
F_o 0.000000e+00 1.482604e+00 1.482604e+00
```