```
final simplex: (array([[1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559450e+00,
                                                                    1.69796372e+00, 2.44374556e+01, 1.56327369e+00],
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890419e+02, 2.82862557e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                    3.47890419e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                     1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
           ['SM data type data plots for mutation', 'Sensor 44 4e+00, 1.4195063 2e+05 Initial Guess 9e-03, 8.75559450e+00, cer -> sensor (GFP output) inducer -> S_{[1]} [69796371e+00] [7983823] [7983823] [7983823] [7983823] [7983823] [7983823] [7983823] [7983823] [7983823] [7983823] [7983823]
     inducer -> sensor (GFP output)
                                                                     3.47890420e+02, 2.82862556e+04Converged 84e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05Converged 39e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.4437455 e+01 Converged 9e+00],
[1<del>.04663445e+03, 7</del>.9783823 e+03 Converged 9e+03, 1.18505414e+00,
                                                                     3.47890419e+02, 2.$2862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.\pmu1950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
                                               10^{3}
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890419e+02, 2.$2862557e+04, 4.69834884e-03, 3.01381452e+00,
10^{3}
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                      <del>.69796371e+00, 2</del>.44374556e+01, 1.56327369e+00],
                                                                    \begin{array}{l} 11.04663445\underline{e}+03.7\underline{.}97838233\underline{e}+03,\ 1.39726999\underline{e}+03,\ 1.18505414\underline{e}+00,\ 5.47890420\underline{e}+02\underline{,}\ 2.82862556\underline{e}+04,\ 4.69834884\underline{e}-03,\ 3.01381452\underline{e}+00,\ \end{array}
                    10^{-3}
   10^{-5}
            10^{-4}
                             10^{-2}
                                      10^{-1}
                                                   10^{-5}
                                                           10^{-4}
                                                          Full circuit Գարի գան հայաստան 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
       inducer -> S -| Output (GFP)
                                                                                <del>lẽ+00, 2.4</del>4374556e+01, 1.56327369e+00],
                                            5 \times 10^{3}
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.$2862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                            4 \times 10^3
                                                                      ▶69796371e+00, 2.44374556e+01, 1.56327369e+00],
                                                                       \Q4663445e+03, 7.\p97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                       47890419e+02, 2.$2862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                    3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00, 1.69796371e+00, 2.44374556e+01, 1.56327369e+00], [1.04663445e+03, 9.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                            3 \times 10^{3}
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                     <u>1</u><sub>0</sub><del>6</del>9796<u>3</u>7<u>1</u>e+00<u>1</u>2<del>-4</del>4374556e+01, 1.56327369e+00],
                             10^{-2}
   10^{-5}
            10^{-4}
                    10<sup>-3</sup>
                                     10^{-1}
                                                   10^{-5}
                                                           10^{-4}
                                                                    [1̃.046634̃45e+03, 7̃.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
          Across all four plots:
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
            RSS (converged)=0.014
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
            RSS (initial)=0.926
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00],
            RSS (% reduction)=0.985
                                                                    [1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
                                                                     3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                   epsilon Initial guesses
                                             Converged
                                                                     3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559450e+00,
               438.237352
                                608.397103 1046.634455
                                                                    1.69796372e+00, 2.44374556e+01, 1.56327369e+00]]), array([0.01441366, 0.01441366, 0.01441366, 0.01441366, 0.01441366,
         Bs -7272.075368
                                15250.457700 7978.382332
                                                                    0.01441366, 0.01441366, 0.01441366, 0.01441366, 0.01441366,
              -270.789063
                                1668.059050 1397.269987
                                                                    0.01441366, 0.01441366, 0.01441366, 0.01441366, 0.01441366,
                -0.013879
                                1.198934
                                              1.185054
                                                                    0.01441366]))
               -340.074273
                                687.964693 347.890420
                                                                      fun: 0.014413660223838751
               4788.644209
                               23497.611400 28286.255609
         Βr
                                                                    message: 'Optimization terminated successfully.'
         Сr
                -0.057669
                                0.062367
                                              0.004698
                                                                      nfev: 34513
                 2.622084
                                0.391731
         Νr
                                              3.013815
                                                                      nit: 26239
         Ah
               -586.706453
                                 590.606548
                                                 3.900095
                                                                     status: 0
         B h 106663.506101
                                 35287.125700 141950.631801
                                                                    success: True
         C h
                 0.000554
                                 0.000530
                                              0.001084
                                                                        x: array([1.04663445e+03, 7.97838233e+03, 1.39726999e+03, 1.18505414e+00,
         Αо
                 7.925765
                                0.829830
                                              8.755594
                                                                    3.47890420e+02, 2.82862556e+04, 4.69834884e-03, 3.01381452e+00,
                 -2.590206
                                 4.288170
                                              1.697964
                                                                    3.90009464e+00, 1.41950632e+05, 1.08379839e-03, 8.75559449e+00,
         Со
                 21.304234
                                 3.133222
                                              24.437456
                                                                    1.69796371e+00, 2.44374556e+01, 1.56327369e+00])
                 -0.245745
                                 1.809018
                                              1.563274
         N_o
```

 10^{4}

 10^{4}