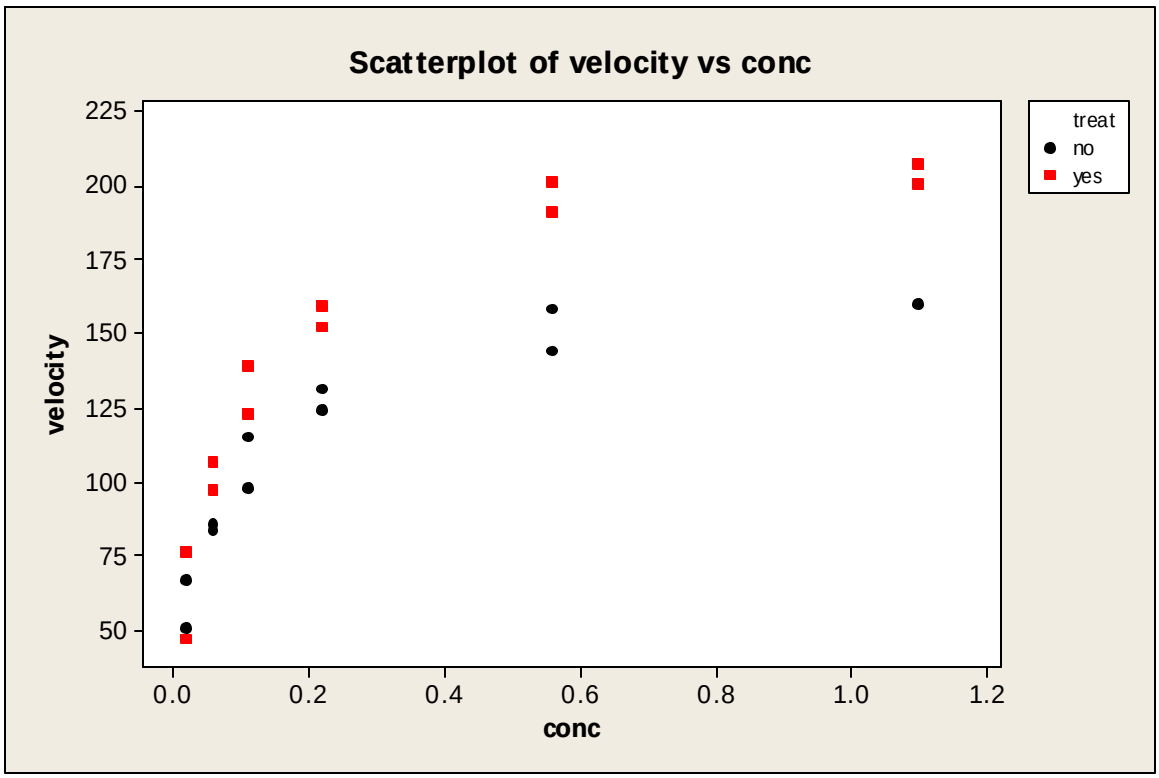

conc	treat	dummy	velocity
0.02	no	0	67
0.02	no	0	51
0.06	no	0	84
0.06	no	0	86
0.11	no	0	98
0.11	no	0	115
0.22	no	0	131
0.22	no	0	124
0.56	no	0	144
0.56	no	0	158
1.10	no	0	160
0.02	yes	1	76
0.02	yes	1	47
0.06	yes	1	97
0.06	yes	1	107
0.11	yes	1	123
0.11	yes	1	139
0.22	yes	1	159
0.22	yes	1	152
0.56	yes	1	191
0.56	yes	1	201
1.10	yes	1	207
1.10	yes	1	200

```
proc nlin;
  parms th1=150 th2=0.10;
  model velocity=th1*conc/(th2+conc);
  by treat;
run;
```

---------- treat=no ----------

The NLIN Procedure
Dependent Variable velocity
Method: Gauss-Newton

Iterative Phase

Iter	th1	th2	Sum of Squares
0	150.0	0.1000	8742.6
1	158.5	0.0239	3968.8
2	155.1	0.0376	1044.3
3	158.9	0.0453	867.9
4	160.0	0.0473	859.8
5	160.2	0.0476	859.6
6	160.3	0.0477	859.6
7	160.3	0.0477	859.6
8	160.3	0.0477	859.6

NOTE: Convergence criterion met.

Estimation Summary

Method	Gauss-Newton
Iterations	8
R	6.74E-6
PPC(th2)	3.298E-6
RPC(th2)	0.000023
Object	2.445E-9
Objective	859.6043
Observations Read	11
Observations Used	11
Observations Missing	0

NOTE: An intercept was not specified for this model.

Source	DF	Sum of Squares	Mean Square	F Value	Approx Pr > F
Model	2	147348	73674.2	771.36	<.0001
Error	9	859.6	95.5116		
Uncorrected Total	11	148208			

Parameter	Estimate	Approx Std Error	Approximate 95% Confidence Limits	
th1	160.3	6.4802	145.6	174.9
th2	0.0477	0.00778	0.0301	0.0653

Approximate Correlation Matrix

	th1	th2
th1	1.0000000	0.7768268
th2	0.7768268	1.0000000

---------- treat=yes ----------

The NLIN Procedure
Dependent Variable velocity
Method: Gauss-Newton

Iterative Phase

Iter	th1	th2	Sum of Squares

```
                    0       150.0       0.1000      36690.8
                    1       212.0       0.0390       4825.2
                    2       208.8       0.0558       1335.6
                    3       212.0       0.0628       1198.2
                    4       212.6       0.0640       1195.5
                    5       212.7       0.0641       1195.4
                    6       212.7       0.0641       1195.4
                    7       212.7       0.0641       1195.4
      NOTE: Convergence criterion met.

                          Estimation Summary
                   Method                       Gauss-Newton
                   Iterations                              7
                   R                                4.254E-6
                   PPC(th2)                         1.737E-6
                   RPC(th2)                         0.000018
                   Object                           2.137E-9
                   Objective                        1195.449
                   Observations Read                      12
                   Observations Used                      12
                   Observations Missing                    0

            NOTE: An intercept was not specified for this model.

                                           Sum of        Mean               Approx
  Source                      DF          Squares      Square    F Value    Pr > F
  Model                        2           270214      135107    1130.18    <.0001
  Error                       10           1195.4       119.5
  Uncorrected Total           12           271409

                                              Approx
         Parameter       Estimate        Std Error    Approximate 95% Confidence Limits
         th1                212.7           6.9472        197.2        228.2
         th2               0.0641          0.00828       0.0457       0.0826

                        Approximate Correlation Matrix
                                        th1             th2
                   th1          1.0000000       0.7650836
                   th2          0.7650836       1.0000000
```

```
proc nlin data=one;
  parms th1=150 th2=0.10 th3=0 th4=0;
  model velocity=((th1+th3*dummy)*conc)/(th2+th4*dummy+conc);
run;
```

```
                              The NLIN Procedure
                          Dependent Variable velocity
                              Method: Gauss-Newton

                                Iterative Phase
                                                                     Sum of
      Iter          th1           th2           th3           th4      Squares
         0        150.0        0.1000             0             0      45433.4
         1        158.5        0.0239       53.5635        0.0151       8794.1
         2        155.1        0.0376       53.7329        0.0182       2379.9
         3        158.9        0.0453       53.0719        0.0175       2066.1
         4        160.0        0.0473       52.5673        0.0167       2055.3
```

5	160.2	0.0476	52.4332	0.0165	2055.1
6	160.3	0.0477	52.4085	0.0164	2055.1
7	160.3	0.0477	52.4044	0.0164	2055.1
8	160.3	0.0477	52.4038	0.0164	2055.1

NOTE: Convergence criterion met.

Estimation Summary

Method	Gauss-Newton
Iterations	8
R	4.37E-6
PPC(th4)	8.932E-6
RPC(th4)	0.000059
Object	1.034E-9
Objective	2055.053
Observations Read	23
Observations Used	23
Observations Missing	0

NOTE: An intercept was not specified for this model.

Source	DF	Sum of Squares	Mean Square	F Value	Approx Pr > F
Model	4	417562	104390	965.14	<.0001
Error	19	2055.1	108.2		
Uncorrected Total	23	419617			

Parameter	Estimate	Approx Std Error	Approximate 95% Confidence Limits	
th1	160.3	6.8960	145.8	174.7
th2	0.0477	0.00828	0.0304	0.0650
th3	52.4038	9.5510	32.4135	72.3942
th4	0.0164	0.0114	-0.00751	0.0403

Approximate Correlation Matrix

	th1	th2	th3	th4
th1	1.0000000	0.7768268	-0.7220184	-0.5628691
th2	0.7768268	1.0000000	-0.5608833	-0.7245748
th3	-0.7220184	-0.5608833	1.0000000	0.7712219
th4	-0.5628691	-0.7245748	0.7712219	1.0000000

```
proc nlin data=one;
  parms th1=150 th2=0.10 th3=0;
  model velocity=((th1+th3*dummy)*conc)/(th2+conc);
run;
```

The NLIN Procedure
Dependent Variable velocity
Method: Gauss-Newton

Iterative Phase

Iter	th1	th2	th3	Sum of Squares
0	150.0	0.1000	0	45433.4
1	161.6	0.0321	47.9824	9612.9
2	162.3	0.0482	41.2622	2595.2

3	165.7	0.0561	41.6938	2251.4
4	166.5	0.0577	41.9696	2241.1
5	166.6	0.0579	42.0189	2240.9
6	166.6	0.0580	42.0251	2240.9
7	166.6	0.0580	42.0259	2240.9
8	166.6	0.0580	42.0260	2240.9

NOTE: Convergence criterion met.

Estimation Summary

Method	Gauss-Newton
Iterations	8
R	1.6E-6
PPC(th2)	7.196E-7
RPC(th2)	6.111E-6
Object	2.06E-10
Objective	2240.891
Observations Read	23
Observations Used	23
Observations Missing	0

NOTE: An intercept was not specified for this model.

Source	DF	Sum of Squares	Mean Square	F Value	Approx Pr > F
Model	3	417376	139125	1241.70	<.0001
Error	20	2240.9	112.0		
Uncorrected Total	23	419617			

Parameter	Estimate	Approx Std Error	Approximate 95% Confidence Limits	
th1	166.6	5.8074	154.5	178.7
th2	0.0580	0.00591	0.0456	0.0703
th3	42.0260	6.2721	28.9426	55.1093

Approximate Correlation Matrix

	th1	th2	th3
th1	1.0000000	0.6112817	-0.5405580
th2	0.6112817	1.0000000	0.0644066
th3	-0.5405580	0.0644066	1.0000000