```
clc;clear;
tspan=[0 20];
Ci=[0.4 0.2 0.1];
[t,C]=ode45('cstr',tspan,Ci);
result=[t C]
plot(t,C(:,1),t,C(:,2),'+',t,C(:,3),'--')
xlabel('time,min');ylabel('concentration,kgmolA/m^3')
legend('CA1','CA2','CA3')
title('Dynamic behaviour of CSTR Reactor Concentration'); grid on
```

```
dc =

    0.5000
         0
         0


dc =

    0.4839
    0.0080
         0


dc =

    0.4765
    0.0115
    0.0001


dc =

    0.4395
    0.0285
    0.0008


dc =

    0.4329
    0.0317
    0.0007


dc =

    0.4253
    0.0350
    0.0010
```

```
dc =

    0.4257
    0.0342
    0.0014


dc =

    0.3792
    0.0537
    0.0031


dc =

    0.3617
    0.0582
    0.0049


dc =

    0.2692
    0.0907
    0.0083


dc =

    0.2432
    0.1126
   -0.0000


dc =

    0.2280
    0.1154
    0.0010


dc =

    0.2465
    0.0872
    0.0154


dc =

    0.2192
    0.0912
    0.0185
```

```
dc =

    0.2090
    0.0910
    0.0200


dc =

    0.1548
    0.0952
    0.0250


dc =

    0.1393
    0.1042
    0.0230


dc =

    0.1304
    0.1034
    0.0237


dc =

    0.1417
    0.0893
    0.0282


dc =

    0.1223
    0.0868
    0.0304


dc =

    0.1155
    0.0844
    0.0310


dc =

    0.0780
```

```
    0.0777
    0.0333


dc =

    0.0643
    0.0842
    0.0328


dc =

    0.0586
    0.0822
    0.0324


dc =

    0.0714
    0.0695
    0.0338


dc =

    0.0590
    0.0636
    0.0340


dc =

    0.0552
    0.0606
    0.0335


dc =

    0.0315
    0.0495
    0.0319


dc =

    0.0192
    0.0534
    0.0330


dc =
```

```
    0.0158
    0.0517
    0.0318


dc =

    0.0299
    0.0421
    0.0297


dc =

    0.0236
    0.0363
    0.0278


dc =

    0.0219
    0.0341
    0.0267


dc =

    0.0095
    0.0240
    0.0227


dc =

    0.0007
    0.0241
    0.0245


dc =

   -0.0012
    0.0231
    0.0234


dc =

    0.0104
    0.0200
    0.0195
```

```
dc =

    0.0075
    0.0159
    0.0168


dc =

    0.0070
    0.0147
    0.0157


dc =

    0.0009
    0.0076
    0.0114


dc =

   -0.0058
    0.0051
    0.0128


dc =

   -0.0070
    0.0048
    0.0123


dc =

    0.0026
    0.0068
    0.0090


dc =

    0.0018
    0.0050
    0.0072


dc =

    0.0017
    0.0046
```

```
    0.0066


dc =

   -0.0004
    0.0013
    0.0036


dc =

   -0.0032
   -0.0014
    0.0029


dc =

   -0.0038
   -0.0017
    0.0028


dc =

    0.0006
    0.0018
    0.0030


dc =

    0.0003
    0.0012
    0.0022


dc =

    0.0003
    0.0011
    0.0020


dc =

   1.0e-03 *

   -0.3301
   -0.2599
    0.3545
```

```
dc =

   -0.0015
   -0.0021
   -0.0011


dc =

   -0.0018
   -0.0023
   -0.0012


dc =

   1.0e-03 *

    0.0954
    0.3113
    0.6772


dc =

   1.0e-03 *

    0.0572
    0.2059
    0.4686


dc =

   1.0e-03 *

    0.0553
    0.1920
    0.4344


dc =

   1.0e-04 *

   -0.5723
   -0.4945
   -0.1905


dc =

   1.0e-03 *
```

```
   -0.2607
   -0.3756
   -0.5678


dc =

   1.0e-03 *

   -0.3125
   -0.4259
   -0.6639


dc =

   1.0e-03 *

    0.0165
    0.0552
    0.1438


dc =

   1.0e-04 *

    0.0992
    0.3645
    0.9731


dc =

   1.0e-04 *

    0.0959
    0.3402
    0.9076


dc =

   1.0e-04 *

   -0.0992
   -0.0933
   -0.1731


dc =

   1.0e-03 *
```

```
   -0.0452
   -0.0686
   -0.1643


dc =

   1.0e-03 *

   -0.0542
   -0.0780
   -0.1937


dc =

   1.0e-04 *

    0.0287
    0.0979
    0.2952


dc =

   1.0e-04 *

    0.0172
    0.0645
    0.1967


dc =

   1.0e-04 *

    0.0166
    0.0602
    0.1842


dc =

   1.0e-05 *

   -0.1719
   -0.1750
   -0.5440


dc =

   1.0e-04 *
```

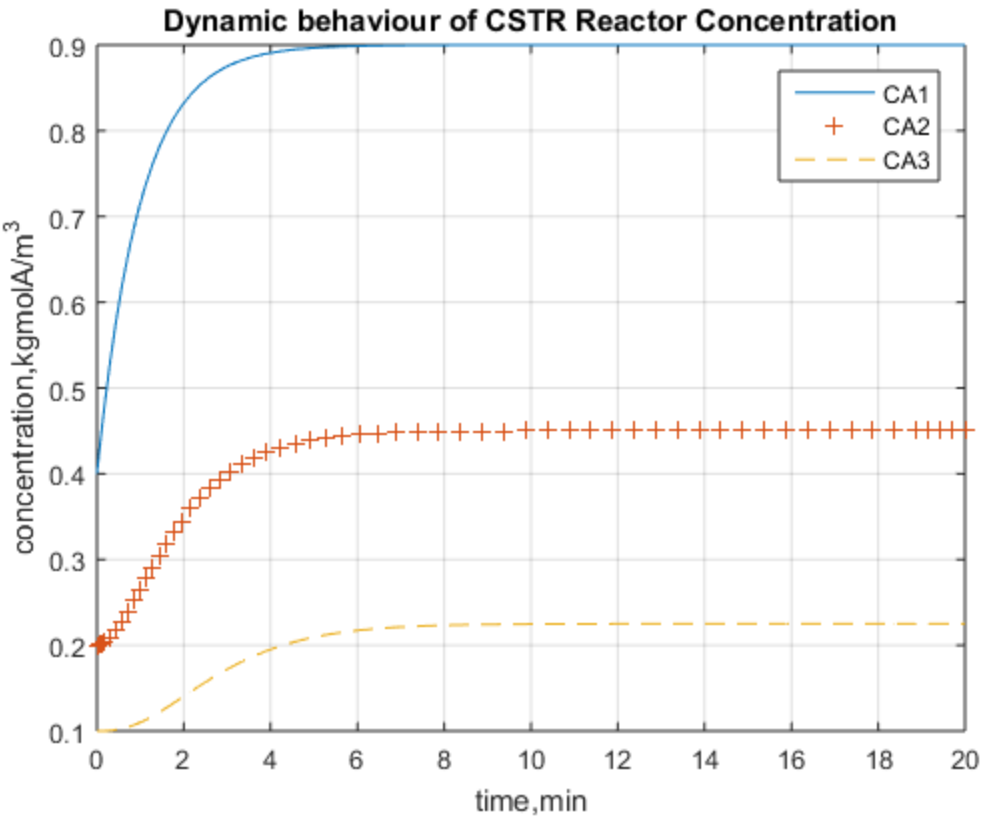
```
   -0.0783
   -0.1249
   -0.3993


dc =

   1.0e-04 *

   -0.0939
   -0.1424
   -0.4725


dc =

   1.0e-05 *

    0.0497
    0.1736
    0.5915


dc =

   1.0e-05 *

    0.0298
    0.1141
    0.3896


dc =

   1.0e-05 *

    0.0288
    0.1066
    0.3662


dc =

   1.0e-05 *

   -0.0298
   -0.0326
   -0.1367


dc =

   1.0e-05 *
```

```
   -0.1358
   -0.2269
   -0.8916


dc =

   1.0e-04 *

   -0.0163
   -0.0259
   -0.1057


dc =

   1.0e-05 *

    0.0086
    0.0308
    0.1164


dc =

   1.0e-06 *

    0.0517
    0.2017
    0.7601


dc =

   1.0e-06 *

    0.0499
    0.1887
    0.7161


dc =

   1.0e-06 *

   -0.0517
   -0.0605
   -0.3109


dc =

   1.0e-05 *
```

```
   -0.0235
   -0.0411
   -0.1892


dc =

   1.0e-05 *

   -0.0282
   -0.0471
   -0.2246


dc =

   1.0e-06 *

    0.0149
    0.0544
    0.2260


dc =

   1.0e-06 *

    0.0116
    0.0439
    0.1813


dc =

   1.0e-06 *

    0.0107
    0.0409
    0.1690


dc =

   1.0e-07 *

    0.0415
    0.2091
    0.8285


dc =

   1.0e-07 *
```

```
   -0.0103
    0.0954
    0.2759


dc =

   1.0e-07 *

   -0.0206
    0.0686
    0.1487


dc =

   1.0e-07 *

    0.0487
    0.2044
    0.8430


result =

         0    0.4000    0.2000    0.1000
    0.0402    0.4197    0.2002    0.1000
    0.0804    0.4386    0.2008    0.1000
    0.1206    0.4568    0.2017    0.1000
    0.1608    0.4743    0.2029    0.1001
    0.2974    0.5286    0.2091    0.1005
    0.4339    0.5760    0.2177    0.1013
    0.5705    0.6174    0.2281    0.1025
    0.7071    0.6535    0.2396    0.1044
    0.8456    0.6854    0.2519    0.1068
    0.9842    0.7131    0.2646    0.1097
    1.1227    0.7373    0.2773    0.1130
    1.2612    0.7583    0.2899    0.1167
    1.4325    0.7806    0.3048    0.1218
    1.6037    0.7994    0.3190    0.1272
    1.7750    0.8153    0.3324    0.1328
    1.9462    0.8286    0.3448    0.1386
    2.1636    0.8426    0.3591    0.1459
    2.3811    0.8538    0.3718    0.1532
    2.5985    0.8628    0.3831    0.1601
    2.8159    0.8701    0.3929    0.1668
    3.0818    0.8771    0.4032    0.1743
    3.3476    0.8825    0.4118    0.1812
    3.6135    0.8865    0.4189    0.1874
    3.8793    0.8896    0.4248    0.1930
    4.2240    0.8927    0.4309    0.1991
    4.5686    0.8949    0.4355    0.2042
    4.9133    0.8963    0.4391    0.2085
    5.2580    0.8974    0.4419    0.2119
```

5.6626	0.8983	0.4442	0.2151
6.0672	0.8989	0.4459	0.2176
6.4719	0.8992	0.4471	0.2195
6.8765	0.8994	0.4480	0.2210
7.3765	0.8997	0.4487	0.2222
7.8765	0.8998	0.4492	0.2231
8.3765	0.8999	0.4495	0.2237
8.8765	0.8999	0.4496	0.2241
9.3765	0.8999	0.4498	0.2244
9.8765	0.9000	0.4499	0.2246
10.3765	0.9000	0.4499	0.2247
10.8765	0.9000	0.4499	0.2248
11.3765	0.9000	0.4500	0.2249
11.8765	0.9000	0.4500	0.2249
12.3765	0.9000	0.4500	0.2249
12.8765	0.9000	0.4500	0.2250
13.3765	0.9000	0.4500	0.2250
13.8765	0.9000	0.4500	0.2250
14.3765	0.9000	0.4500	0.2250
14.8765	0.9000	0.4500	0.2250
15.3765	0.9000	0.4500	0.2250
15.8765	0.9000	0.4500	0.2250
16.3765	0.9000	0.4500	0.2250
16.8765	0.9000	0.4500	0.2250
17.3765	0.9000	0.4500	0.2250
17.8765	0.9000	0.4500	0.2250
18.3765	0.9000	0.4500	0.2250
18.8765	0.9000	0.4500	0.2250
19.1574	0.9000	0.4500	0.2250
19.4382	0.9000	0.4500	0.2250
19.7191	0.9000	0.4500	0.2250
20.0000	0.9000	0.4500	0.2250



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