Example 9-3
(This is Problem 9.2 in Harrison, Todd, Rudge, Petrides, Bioseparations Science and Engineering, 2003, Oxford University Press, pp. 287-288)

The following crystal size distribution data were obtained with a multichannel Coulter counter during a crystallization experiment in a batch agitated vessel with isothermal conditions. The results of two CSD samples taken at 3600 s (t′) and 4500 s (t″) are shown in the table below. Use the method of moments analysis to determine

A) the average nucleation rate
B) the average crystal growth rate
C) the average crystal size at each time

$\overline{L}$ (m)	ΔL (m)	n′ (#/mkg)	n" (#/mkg)
1.74E-05	4.00E-06	1.81E+12	1.76E+12
2.19E-05	5.00E-06	4.36E+11	5.57E+11
2.76E-05	6.40E-06	2.45E+11	3.21E+11
3.48E-05	8.00E-06	2.18E+11	2.34E+11
4.38E-05	1.01E-05	1.38E+11	1.76E+11
5.52E-05	1.27E-05	1.39E+11	1.81E+11
6.96E-05	1.60E-05	6.40E+10	9.30E+10
8.77E-05	2.02E-05	3.80E+10	4.80E+10
1.11E-04	2.54E-05	7.00E+09	1.30E+10
1.39E-04	3.20E-05	4.00E+09	3.00E+09
1.75E-04	4.03E-05	6.00E+08	1.20E+09
2.21E-04	5.08E-05	0.00E+00	9.00E+08

Note: All of the measurements are converted to SI units (m).