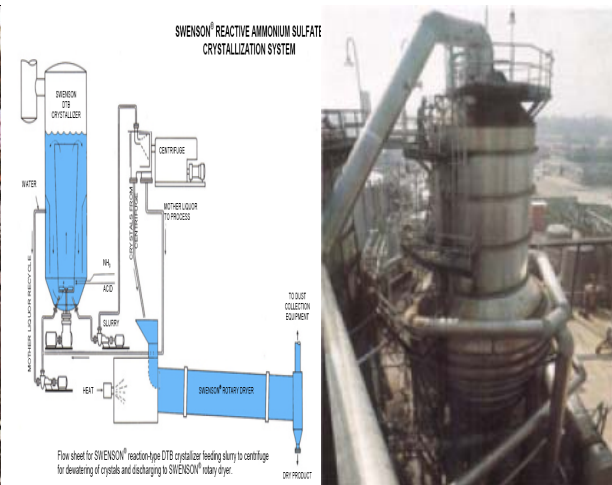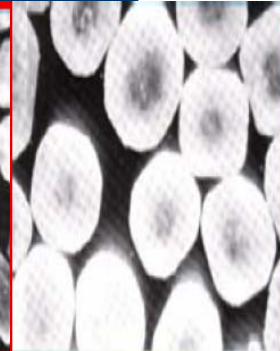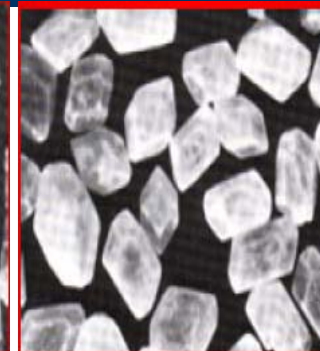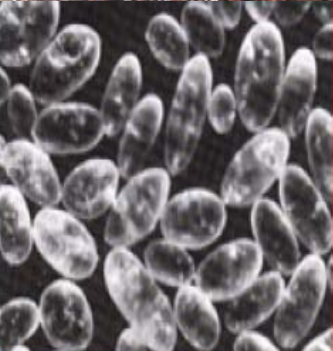# Crystallizer

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BUET

Problem

- A solute that form crystals is to be precipitated from solution at a rate of 10,000lb of solid (dry basis) per hour using 1,000lb/hr of seed crystals. If no nucleation occurs and the seed crystal have the following size distribution, determine the product size distribution

Problem

Tyler Sieve Mesh	Weight Fraction Retained
-48+65	0.10
-65+100	0.30
-100+150	0.50
-150+200	0.05
-200+270	0.05

Tyler Standard Screen Size

Appendix C-8.   TYLER STANDARD SCREEN SIZES

Interval = $\sqrt{2}$

Standard Interval = $\sqrt{2}$, Aperture, in.	Aperture, in.	Aperture, mm	Mesh Number	Wire Diameter, in
	1.050	26.67	...	0.148
1.050	0.883	22.43	...	0.135
	0.742	18.85	...	0.135
0.742	0.624	15.85	...	0.120
	0.525	13.33	...	0.105
0.525	0.441	11.20		0.105
	0.371	9.423	...	0.092
0.371	0.312	7.925	$2\frac{1}{2}$	0.088
	0.263	6.680	3	0.070
0.263	0.221	5.613	$3\frac{1}{2}$	0.065
	0.185	4.699	4	0.065
0.185	0.156	3.962	5	0.044
	0.131	3.327	6	0.036
0.131	0.110	2.794	7	0.0326
	0.093	2.362	8	0.032
0.093	0.078	1.981	9	0.033
	0.065	1.651	10	0.035
0.065	0.055	1.397	12	0.028
	0.046	1.168	14	0.025
0.046	0.0390	0.991	16	0.0235
	0.0328	0.833	20	0.0172
0.0328	0.0276	0.701	24	0.0141
	0.0232	0.589	28	0.0125
0.0232	0.0195	0.495	32	0.0118
	0.0164	0.417	35	0.0122
0.0164	0.0138	0.351	42	0.0100
	0.0116	0.295	48	0.0092
0.0116	0.0097	0.248	60	0.0070
	0.0082	0.208	65	0.0072
0.0082	0.0069	0.175	80	0.0056
	0.0058	0.147	100	0.0042
0.0058	0.0049	0.124	115	0.0038
	0.0041	0.104	150	0.0026
0.0041	0.0035	0.088	170	0.0024
	0.0029	0.074	200	0.0021
0.0029	0.0024	0.061	230	0.0016
	0.0021	0.053	270	0.0016
0.0021	0.0017	0.043	325	0.0014
	0.0015	0.038	400	0.0010
0.0015				

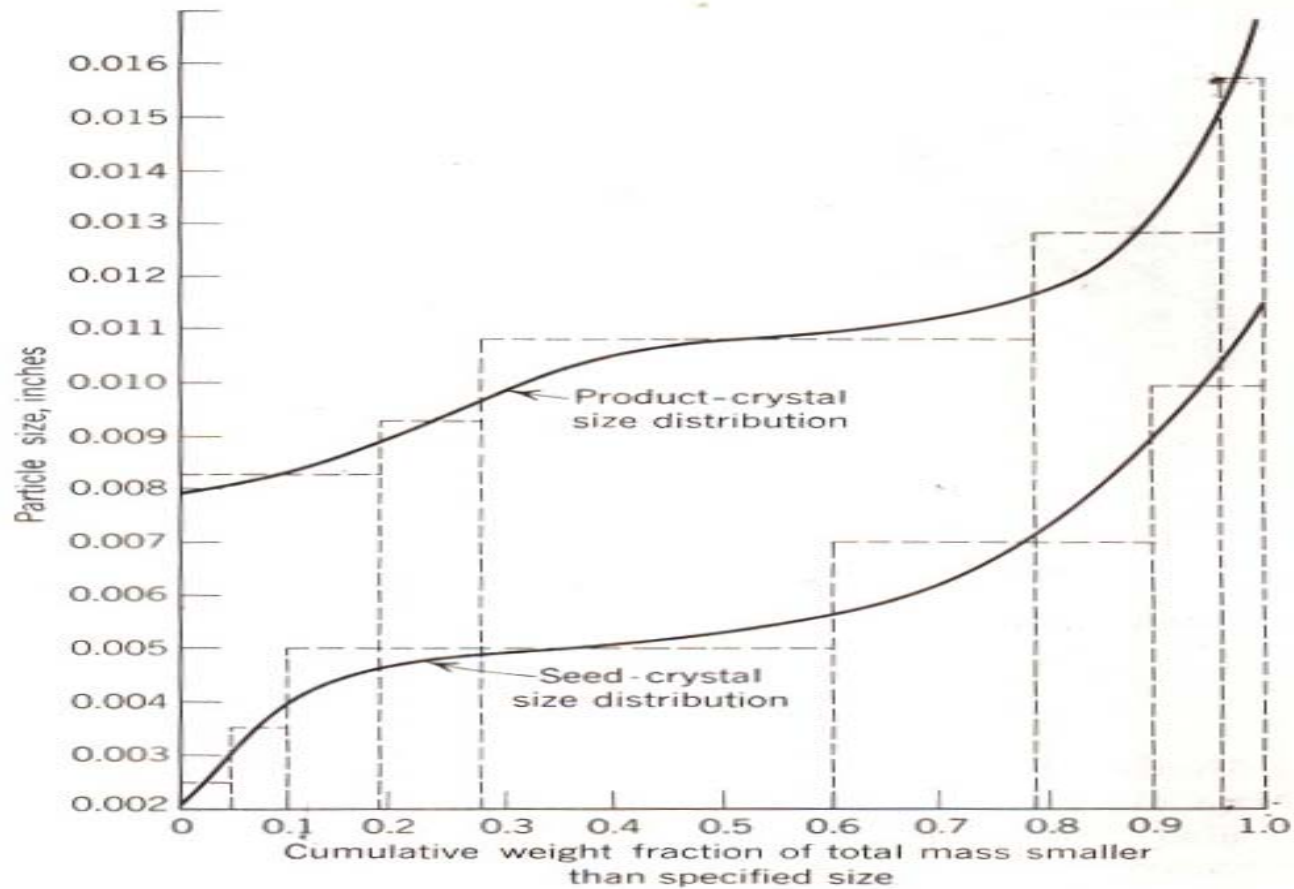# Crystallizer Seed and Product Particle-Size Distribution

Figure 19.31. Crystallizer-seed and product particle-size distribution, Illustration 19.5.