

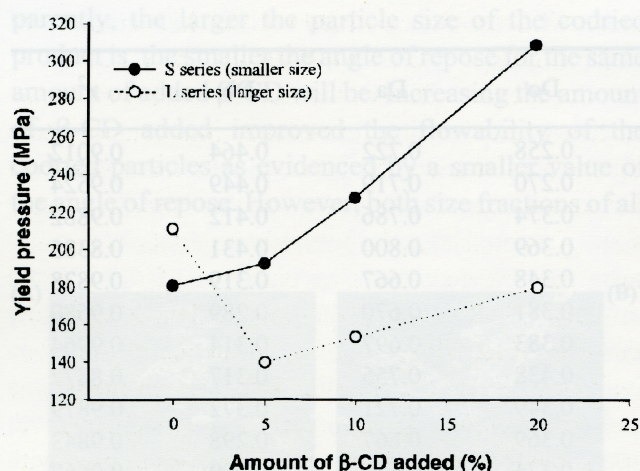


Fig. 2. Relationship between yield pressure and the amount of β -cyclodextrin added to codried products of 2 size fractions. (O): 61–149 μm ; (●): 37–61 μm .

same influence of particle size as that shown by PH101 and 102 or PH301 and 302. A plot of yield pressure versus the amount of β -CD added is shown in Fig. 2. This illustrates that yield pressure increased with the increasing amount of added β -CD for both size fractions of codried particles. On the contrary, the yield pressure of tablets for the small-sized codried particles (S series) was lower than that for the large-sized codried particles (L series). Since the yield

pressure of β -CD was higher than that of Avicel PH101 and 102, the increase in yield pressure with increasing amounts of β -CD added to the particles would be expected. With MCC as the sole component in the particles, the fiberlike structure of MCC on the surface of the particles (as examined by SEM) may have been an interactive factor with the influence of particle size on yield pressure. However, the rounded shape of the codried particles prepared by codrying MCC with β -CD possibly minimizes the ability of the fiber structure of MCC to the interlock with surfaces of particles. In that case, the larger the size of the codried particles is, the fewer the bonding points that can be formed among particles resulting in the need for a larger compression force to form tablets. This explains why yield pressures of smaller-sized codried particles are lower than those of larger-sized particles.

Table 3 lists the tensile strength of tablets produced from codried products of two size fractions and two grades of Avicel products. Fig. 3 further demonstrates the relationship between tensile strength and porosity at four different compression forces. Results demonstrate that the tensile strength of tablets produced from PH101 and 102 does increase to a greater extent with increasing compression forces than did that for PH301 and 302. On the other hand, increasing the amount of β -CD added to the codried particles in-

Table 3. Tensile strength (TS, MPa) and porosity of tablets produced from various MCC products compressed at four different forces

	Compression force (10^3 kg)							
	0.25 (48.74 MPa)		0.50 (97.48 MPa)		0.75 (146.22 MPa)		1.00 (194.97 MPa)	
	TS	Porosity	TS	Porosity	TS	Porosity	TS	Porosity
PH101	4.32 ± 0.56^a	0.212 ± 0.016	4.30 ± 0.91	0.207 ± 0.020	6.82 ± 0.86	0.138 ± 0.016	7.52 ± 0.57	0.118 ± 0.011
PH102	3.53 ± 0.27	0.222 ± 0.005	4.95 ± 0.27	0.170 ± 0.004	6.17 ± 0.78	0.118 ± 0.005	6.75 ± 0.81	0.111 ± 0.003
PH301	1.99 ± 0.29	0.237 ± 0.027	3.11 ± 0.64	0.154 ± 0.033	3.99 ± 0.40	0.121 ± 0.017	4.80 ± 0.68	0.104 ± 0.016
PH302	2.89 ± 0.23	0.148 ± 0.013	3.17 ± 0.22	0.138 ± 0.012	4.59 ± 0.33	0.074 ± 0.011	4.68 ± 0.31	0.074 ± 0.006
1L	2.01 ± 0.35	0.245 ± 0.019	2.63 ± 0.43	0.202 ± 0.010	3.57 ± 0.68	0.155 ± 0.021	4.77 ± 0.65	0.109 ± 0.010
2L	2.43 ± 0.42	0.245 ± 0.015	3.39 ± 0.41	0.220 ± 0.023	5.46 ± 0.73	0.147 ± 0.005	6.45 ± 0.87	0.121 ± 0.014
3L	3.35 ± 0.77	0.243 ± 0.013	4.50 ± 0.31	0.202 ± 0.010	6.28 ± 0.80	0.159 ± 0.025	7.49 ± 0.81	0.129 ± 0.008
4L	4.22 ± 0.35	0.217 ± 0.012	5.70 ± 0.63	0.179 ± 0.012	7.41 ± 0.71	0.138 ± 0.003	> 8	0.139 ± 0.002
1S	2.88 ± 0.72	0.217 ± 0.025	3.86 ± 0.56	0.185 ± 0.021	5.94 ± 0.78	0.138 ± 0.017	7.07 ± 0.98	0.111 ± 0.017
2S	3.07 ± 0.73	0.232 ± 0.021	4.77 ± 0.79	0.178 ± 0.023	7.45 ± 0.89	0.111 ± 0.015	7.91 ± 0.87	0.085 ± 0.009
3S	4.33 ± 1.06	0.223 ± 0.022	4.70 ± 1.10	0.194 ± 0.025	7.63 ± 1.42	0.124 ± 0.031	> 8	0.093 ± 0.021
4S	4.33 ± 0.78	0.217 ± 0.016	6.19 ± 1.40	0.149 ± 0.017	> 8	0.120 ± 0.014	> 8	0.096 ± 0.019

^aAll values are the mean $\pm$ S.D. ($n = 10$).