Table 2. Calculated values for the heckel plot

	Slope (K*10^{-3})	Intercept (A)	Yield pressure (Py, MPa)	Do	Da	Db	r^2
PH101	4.411	1.280	226.706	0.258	0.722	0.464	0.9012
PH102	5.047	1.270	198.138	0.270	0.719	0.449	0.9524
PH301	3.795	1.542	263.505	0.374	0.786	0.412	0.9882
PH302	5.519	1.610	181.192	0.369	0.800	0.431	0.8385
1L	5.539	1.100	180.538	0.348	0.667	0.319	0.9828
2L	5.190	1.110	192.678	0.381	0.670	0.289	0.9580
3L	4.390	1.195	227.790	0.383	0.697	0.314	0.9964
4L	3.241	1.405	308.547	0.438	0.755	0.317	0.8877
1S	4.738	1.275	211.015	0.349	0.721	0.372	0.9879
2S	7.139	1.100	140.076	0.369	0.667	0.298	0.9843
3S	6.504	1.125	153.752	0.376	0.675	0.299	0.9668
4S	5.560	1.305	179.856	0.424	0.729	0.305	0.9811
β-CD	4.349	2.110	229.900	0.513	0.879	0.366	0.9348

was smaller than that of the former. Both types of Avicel products appeared to have a larger value of D_b than did the codried products. And this value for β-CD was larger than that for the codried products, but smaller than that for both types of Avicel.

Both the D_0 and D_a values for all codried products obviously appeared to be the fractional sum of the values for the corresponding β-CD and pure MCC (the 1S or 1L MCC slurries). Since the D_0 and D_a values for β-CD were the largest, these 2 values for codried products increased with a greater amount of added β-CD. This demonstrates that the addition of β-CD increases the extent of densification before particle deformation when forming tablets. On the other hand, the size of the codried products with different amounts of β-CD and Avicel of both types appeared to have an insignificant effect on these 2 values. Both values for the 2 types of Avicel seemed to increase with decreasing DP value. Probably, the severe hydrolysis used to obtain MCC products with lower DP values is accompanied by more amorphous regions within the structure of the MCC being eradicated resulting in increased particle density. This is reflected by the increased D_0 value with decreasing DP values. D_a is related to how close particles can be packed before particle deformation occurs when forming tablets. Particle shape and the size distribution of materials could be the 2 main factors influencing the D_a value of these MCC products with similar true densities. In terms of these 2 factors, the less fiberlike structure of MCC accompanied by a lower DP value resulted in particles having a smoother surface, while the packing of particles was close enough to produce a larger tapped density. This was the case for the 2 types of Avicel. The granular-like structure of β-CD makes it easier to pack closely resulting in the largest values for both D_0 and D_a.

As discussed above, D_b is related to the change in relative density before particle deformation when forming tablets, and this is an indicator which demonstrates the extent of movement or rearrangement of particles. The larger this value is, the greater the extent of particle movement or rearrangement before deformation is when forming the tablets. In other words, a lesser extent of particle movement or rearrangement means that particles are already in a closer position and just need to move across a shorter distance to experience an appreciable bonding force. As indicated, the addition of β-CD results in a lesser extent of movement or rearrangement of particles. The rounded shape of particles of the codried products with a less fiberlike structure seems to be responsible for this.

As shown in Table 2, yield pressures for Avicel PH101 and 301 were higher than those for PH102 and 302, both of which have similar DP values to the corresponding grade but with a larger mean size. As for 1S and 1L which were codried without adding β-CD, yield pressures of both seem to have experienced the