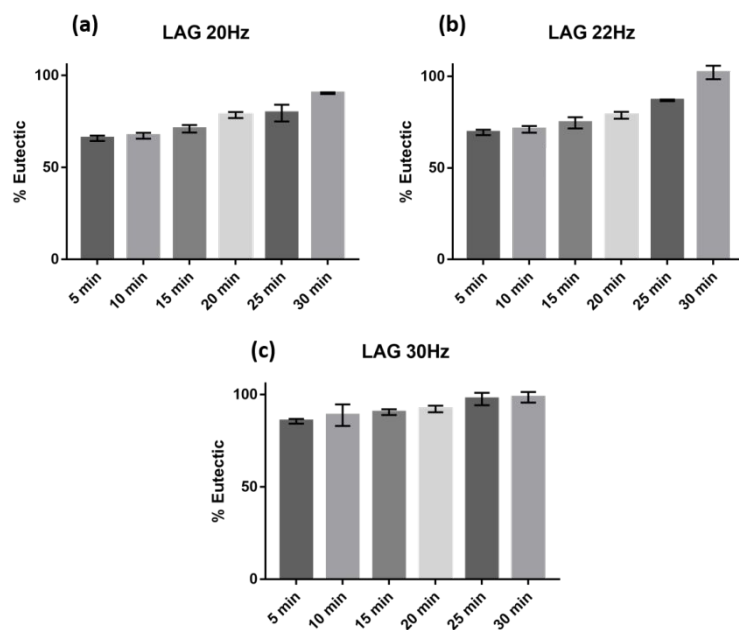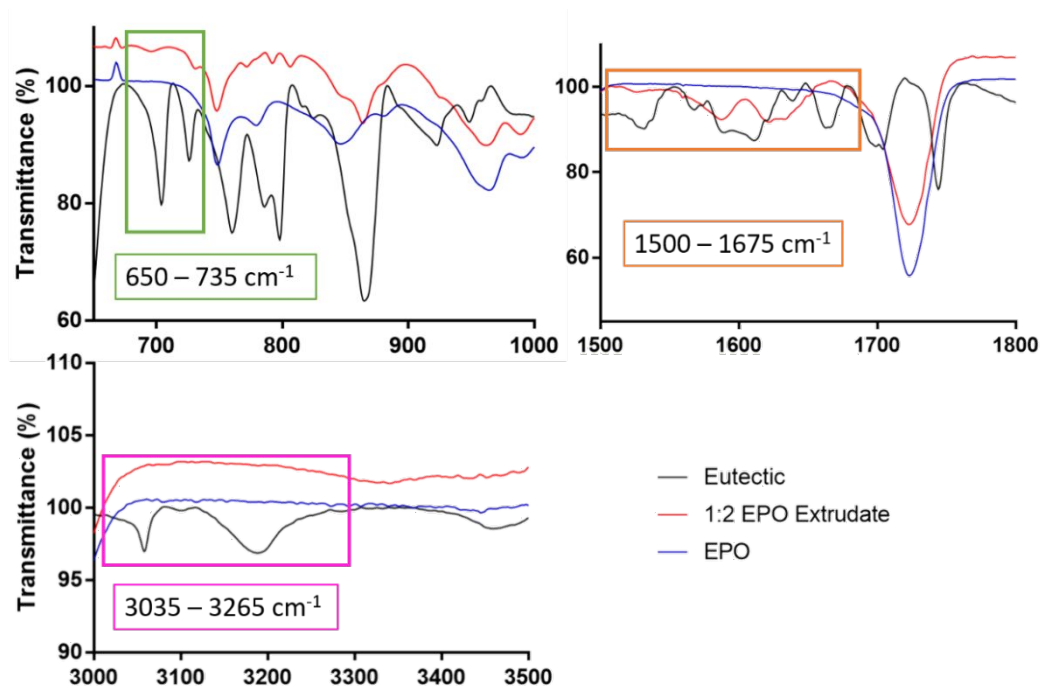*Supplementary Figure 1 Representative overlain DSC thermograms for binary mixtures of ABZ and MA after LAG at varying mole fractions of ABZ.*



*Supplementary Figure 2 Percentage yield of the 1:2 ABZ-MA eutectic during binary LAG, calculated using a PLS model after grinding for varying time periods at (a) 20 Hz, (b) 22 Hz and (c) 30 Hz, respectively.*
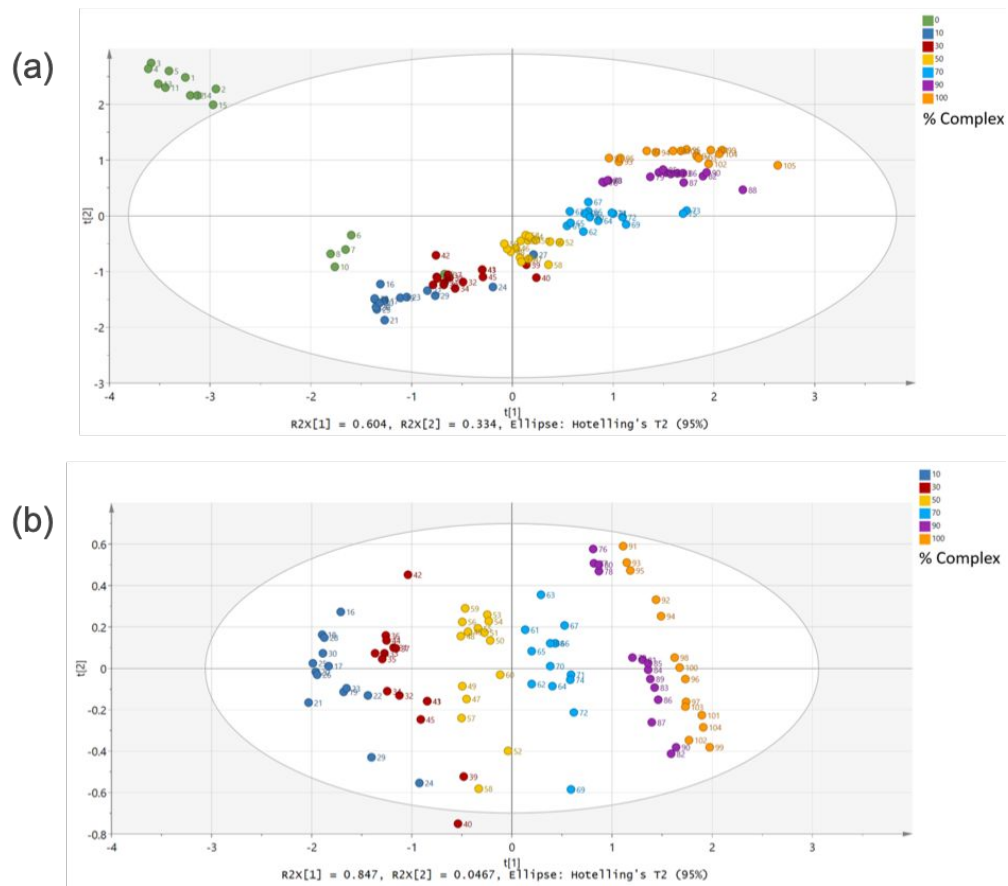
*Supplementary Figure 3* FT-IR spectral regions, 3035 - 3265 cm$^{-1}$, 1500 - 1675 cm$^{-1}$, and 650 - 735 cm$^{-1}$, where EPO was found to show negligible interference to the formation of the ABZ-MA 1:2 eutectic.
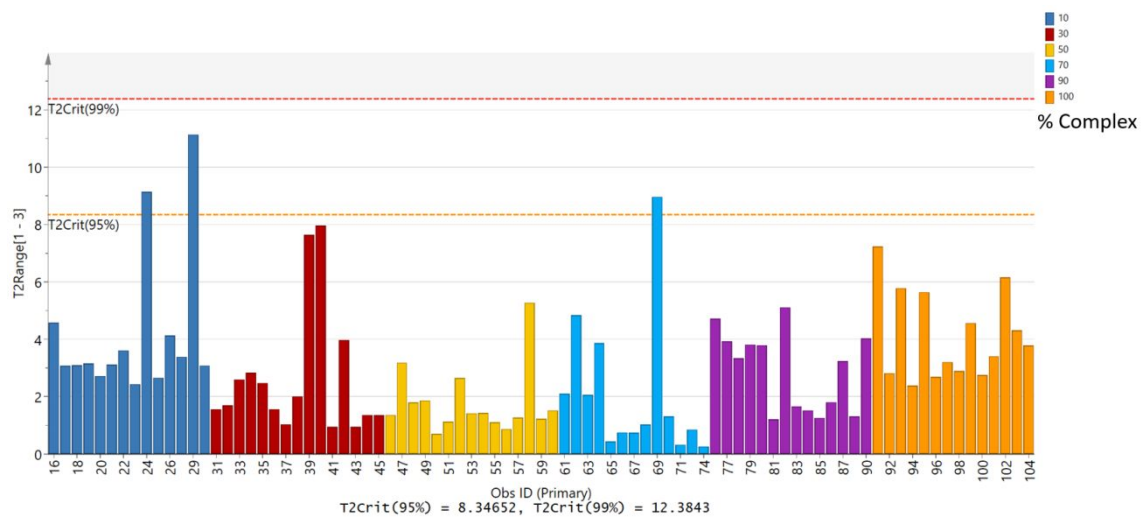
*Supplementary Table 1* Calculated parameters from several versions of the PLS model when data were pre-processed using different spectral filters*.

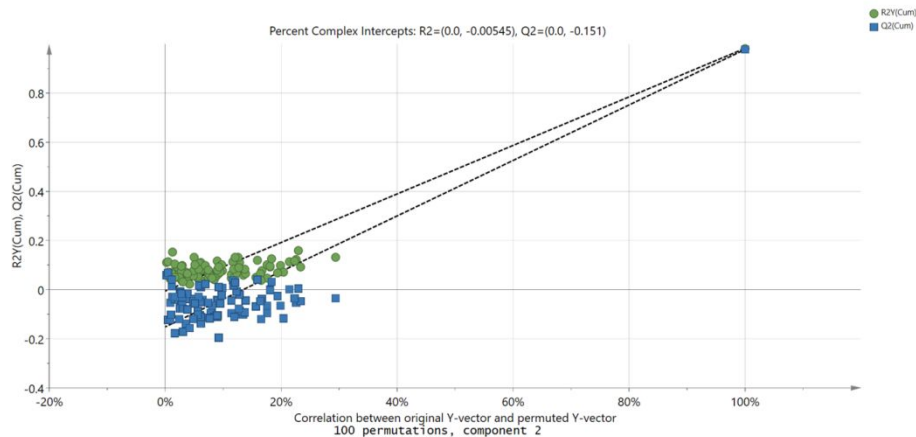| Spectral Filter | R²X | R²Y | Q² | RMSEE | RMSEcv |
|---|---|---|---|---|---|
| Raw data | 0.963 | 0.944 | 0.934 | 8.62 | 9.20 |
| SNV | 0.945 | 0.976 | 0.974 | 5.70 | 5.85 |
| MSC | 0.950 | 0.974 | 0.972 | 5.89 | 6.05 |
| 1st Derivative | 0.958 | 0.978 | 0.974 | 5.45 | 6.07 |
| 2nd Derivative | 0.957 | 0.980 | 0.977 | 5.19 | 5.58 |
| Savitzky-Golay | 0.963 | 0.946 | 0.935 | 8.53 | 9.15 |

* $R^2X$, $R^2$ predicted; $R^2Y$, $R^2$ observed; $Q^2$, indication of model validity; RMSEE, root mean square error of estimation; RMSEcv, root mean square error of cross validation; SNV, standard normalised variate; MSC, multiplicative scatter correction.
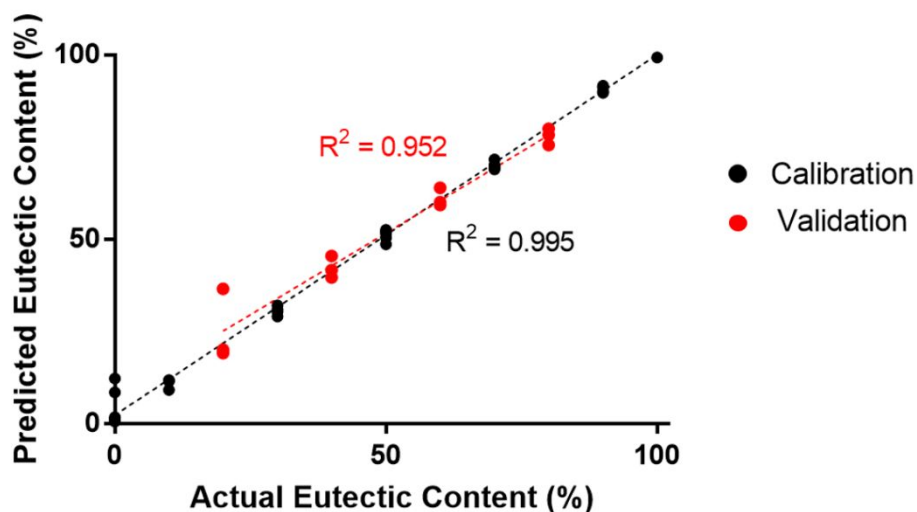
*Supplementary Figure 4* *Score plot of data after application of the first (a) and second (b) derivative filters, respectively, ($t_1$ versus $t_2$), containing two principal components. The plot was coloured according to percentage of the ABZ-MA 1:2 eutectic.*



*Supplementary Figure 5* *Hotelling's T2 plot, showing three suspect outliers and no major outliers in the data after application of the second derivative filter. The 95 % and 99 % confidence limits are shown by the yellow and red dotted lines, respectively. The column plot was coloured according to percentage of the ABZ-MA 1:2 eutectic.*

*Supplementary Figure 6 Response permutation plot for validation of the model, where the green circles represent $R^2Y$ and the blue squares $Q^2$. $Q^2$ intercepted at -0.151 and $R^2$ intercepted at -0.005.*



*Supplementary Figure 7 Graph of observed versus predicted eutectic content (%).*

*Supplementary Table 2 Drug percentage (DP %) and dissolution rate (DR %/min) at particular timepoints for the EPO extrudates of ABZ and ABZ-MA 1:2.*

|  | DP (%) | | | DR (%/min) | | |
|---|---|---|---|---|---|---|
|  | 5 min | 30 min | 120 min | 5 min | 30 min | 120 min |
| **ABZ-EPO** | 7.1±1.2 | 17.7±0.5 | 38.8±0.9 | 1.4±0.2 | 0.6±0.1 | 0.3±7.3x10$^{-3}$ |
| **ABZ-MA-EPO MiniLab** | 8.7±0.6 | 22.3±0.7 | 68.9±1.3 | 1.7±0.1 | 0.7±0.02 | 0.6±4.4x10$^{-3}$ |
| **ABZ-MA-EPO Rondol** | 7.4±1.6 | 24.8±4.2 | 71.5±1.0 | 1.5±0.3 | 0.8±0.1 | 0.6±8.3x10$^{-3}$ |