Indomethacin-Kollidon VA64 Extrudates: A Mechanistic Study of pH-Dependent Controlled Release

Supplementary information
Figure S1: 1100–1770 cm\(^{-1}\) (a) and 40–400 cm\(^{-1}\) (b) Raman regions of \(\gamma\) and \(\alpha\) crystalline indomethacin forms. Data have been variance-scaled before plotting. Y-axis offsets were applied for presentational purpose.
Figure S2: XRPD data of the $\gamma$ and $\alpha$ indomethacin reference forms. Data have been variance-scaled before plotting. Y-axis offsets have been applied for presentational effect.
Figure S3: Raman phonon-mode region (40–400 cm$^{-1}$) of raw materials. Spectra were variance-scaled before plotting. Y-axis offsets were applied for presentational purpose.
Figure S4: XRPD patterns of raw materials. Data were variance-scaled before plotting. Y-axis offsets have been applied for presentational effect.
Figure S5: Trends showing how the compact surface area changes as a function of time in pH 2 HCl dissolution medium. Trends of pure copovidone and the 5% extrudate are shown in (a), while those from the other indomethacin-copovidone extrudates (from 15% to 90% drug loading), the 100% amorphous and 100% γ forms are illustrated in (b).
Figure S6: Dissolution profiles obtained from the RDDR and IDR experiments conducted in pH 2 HCl buffer. For copovidone in the 5% extrudate, trends of both experiments rather than the average are shown due to the significant difference in behavior. The amount of indomethacin released from the 15% and 30% extrudates was undetectable in the present experimental set-up.
Figure S7: Dissolution trends of all materials obtained from the RDDR and IDR experiments conducted at pH 6.8.
Figure S8: Partial RDDR of indomethacin at pH 6.8 as a function of the indomethacin weight fraction for all the extrudates (from 5% to 90% drug loading). Linear best fit for the extrudates containing a drug loading up to 50% is included.

\[ y = 2.1783x + 0.0354 \]
\[ R^2 = 0.9889 \]
Figure S9: Spatially-averaged Raman spectra of the dissolution experiment of (a) 50% extrudate, (b) 70% extrudate, (c) 90% extrudate and (d) 100% amorphous indomethacin, with data being variance-scaled before plotting. Y-axis offsets have been applied for presentational effect and vary between panels.
Figure S10: Phonon-mode Raman region of the 70% extrudate compact collected under dry conditions and after 499 min of immersion in dissolution medium. Y-axis offsets were applied for presentational purpose.
Figure S11: XRPD patterns of the α reference form and the 100% amorphous residue recovered after the dissolution experiment. Y-axis offsets have been applied for presentational effect.