Electronic Supplementary Material (ESI) for RSC Advances.

Supplementary information:
Influence of the amorphous phase and preceding solution processing on the eutectic behaviour in the state diagram of P3HT:$PC_{61}BM$ determined by rapid heat-cool calorimetry

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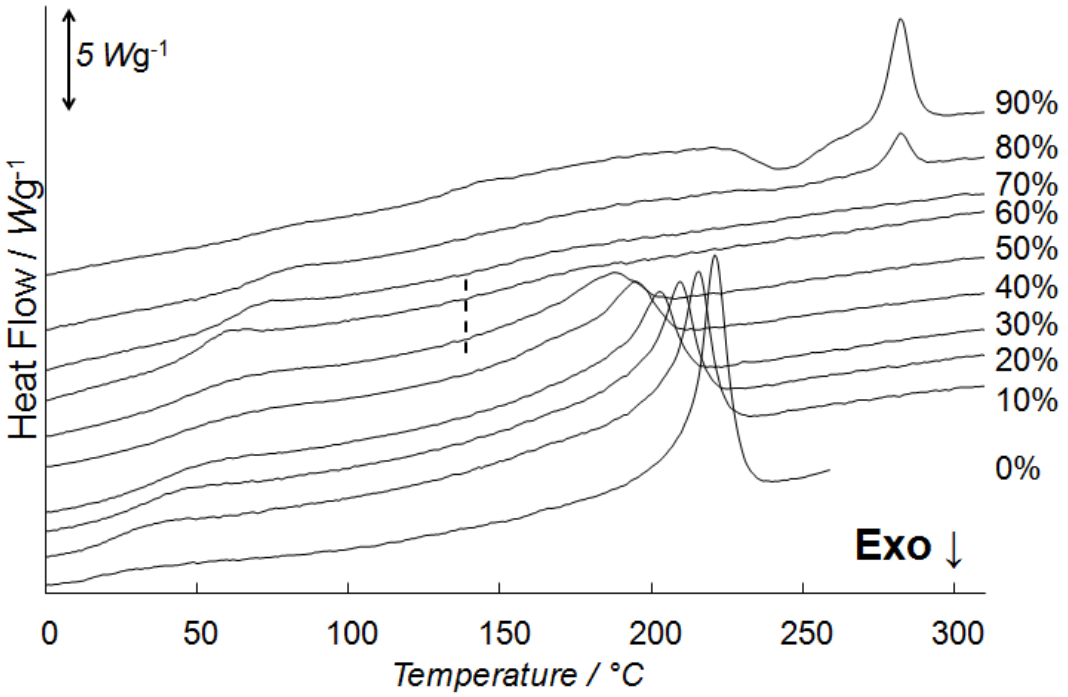

Figure S1: Thermograms of the stirred P3HT-2:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

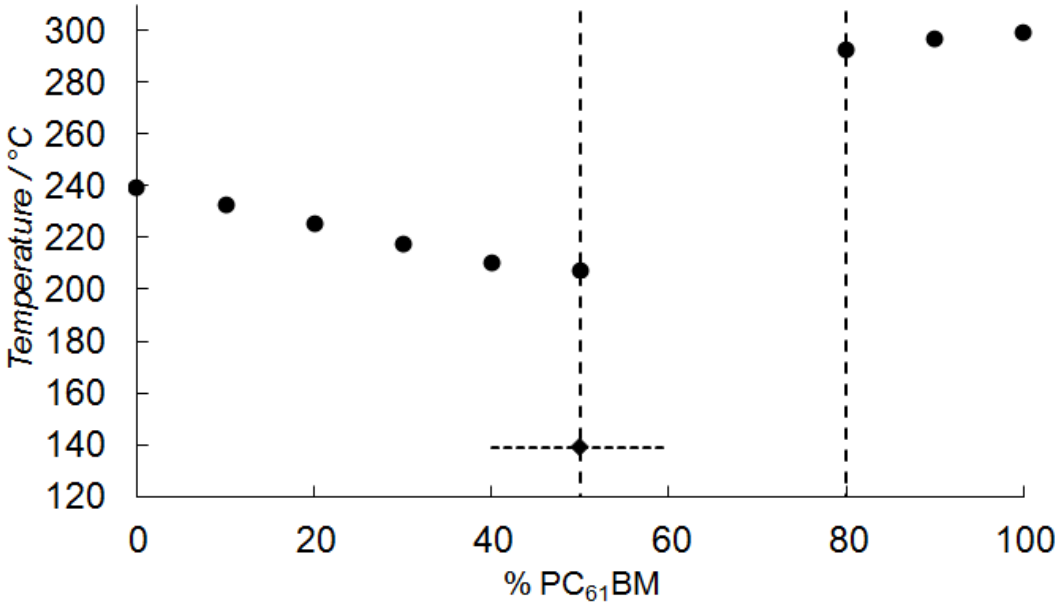

Figure S2: State diagram of stirred P3HT-2:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

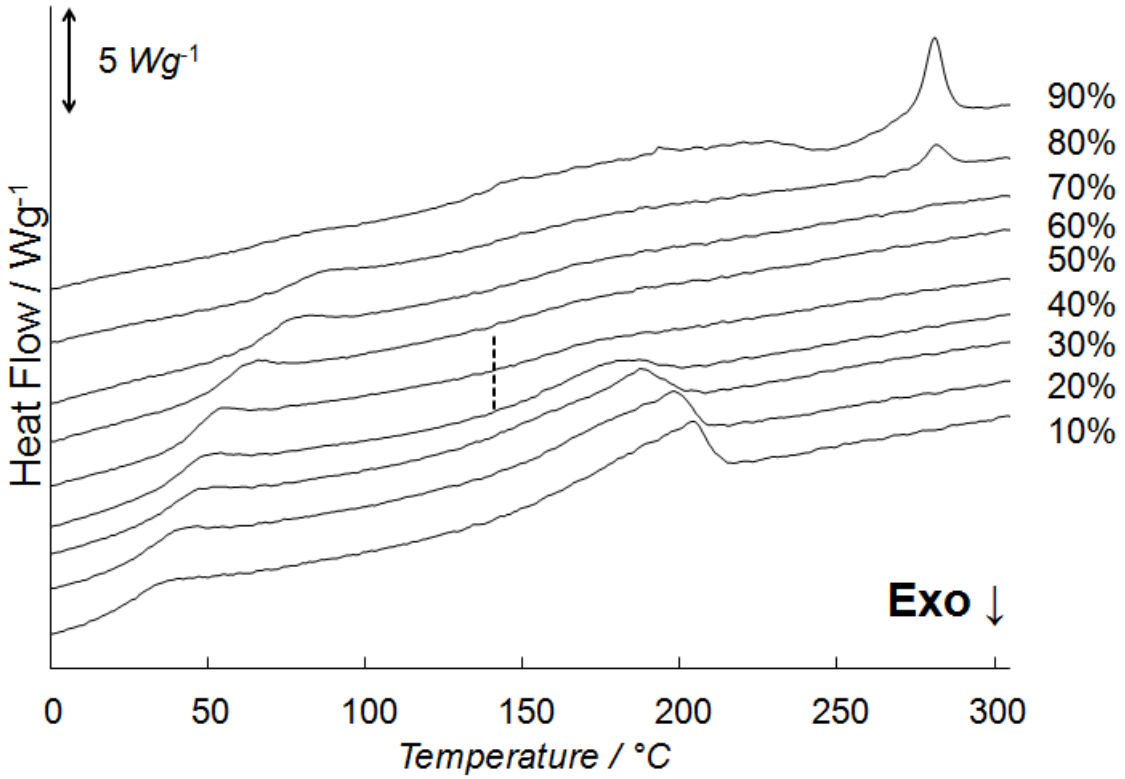

Figure S3: Thermograms of the stirred P3HT-3:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

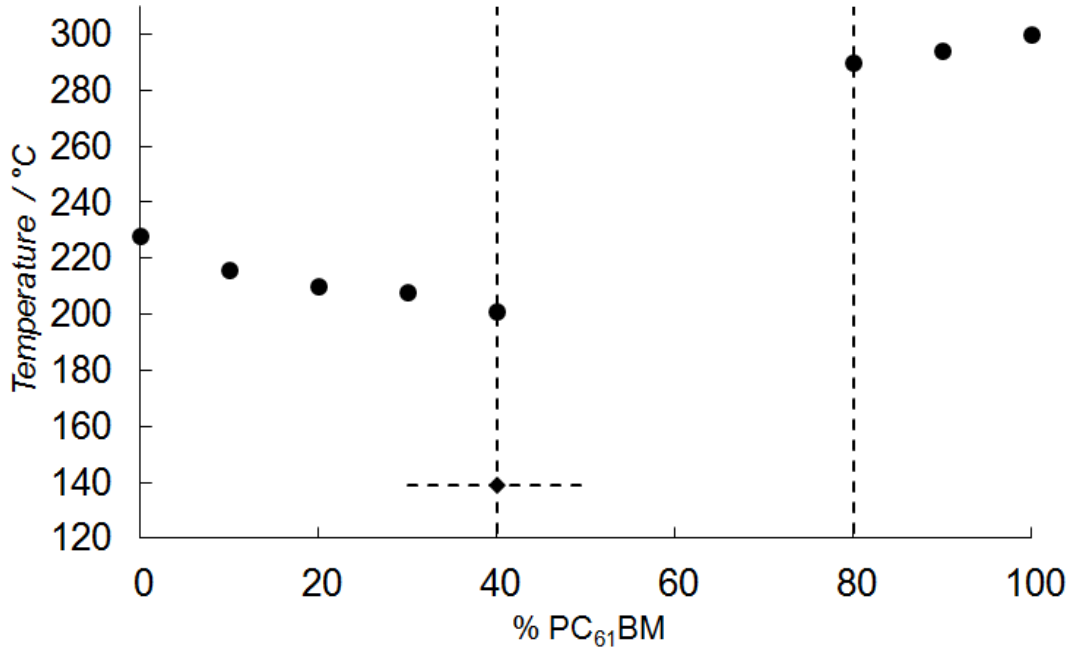

Figure S4: State diagram of stirred P3HT-3:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

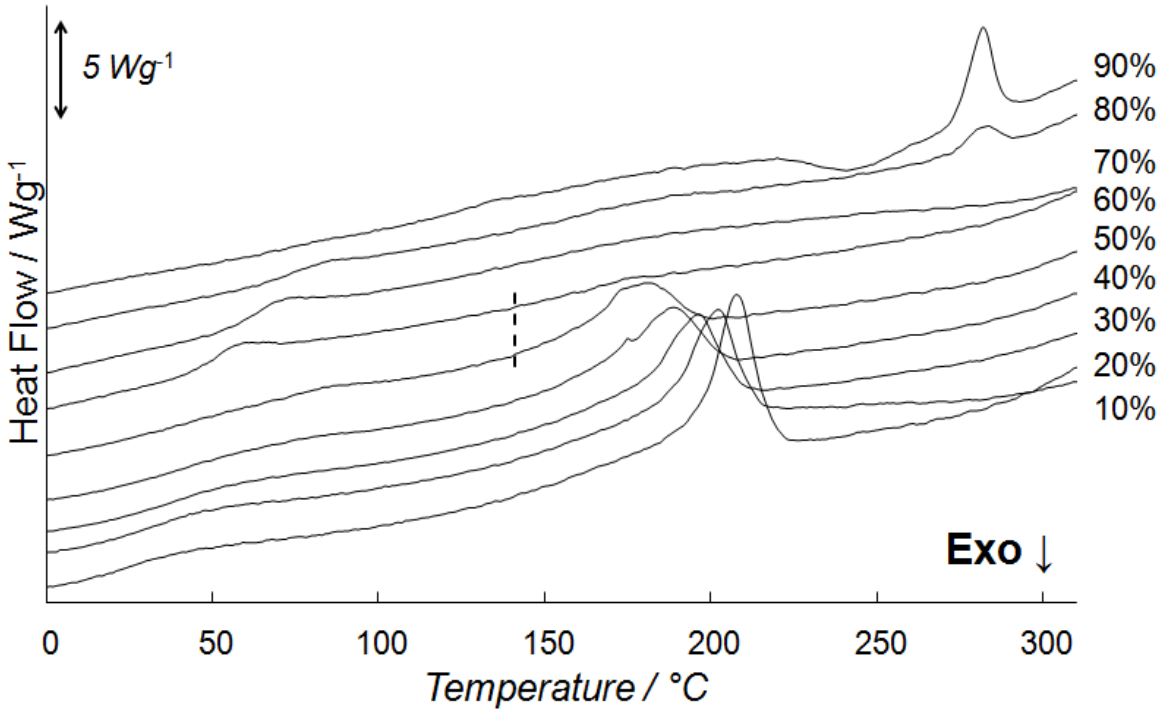

Figure S5: Thermograms of the sonicated P3HT-1:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

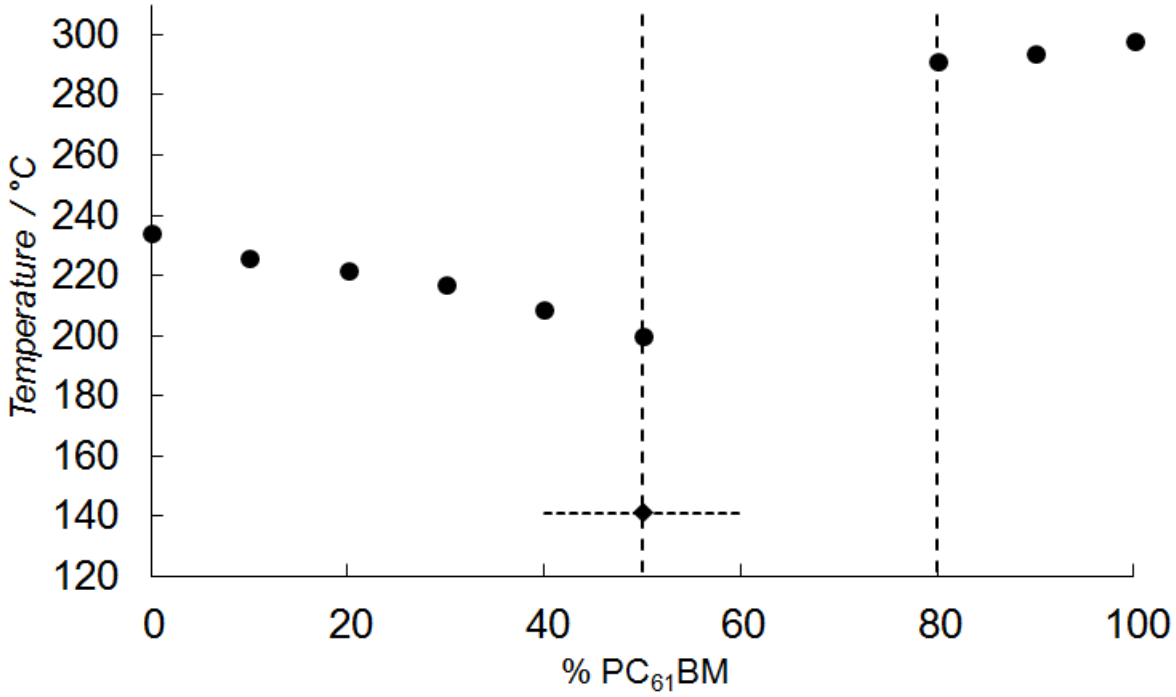

Figure S6: State diagram of sonicated P3HT-1:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

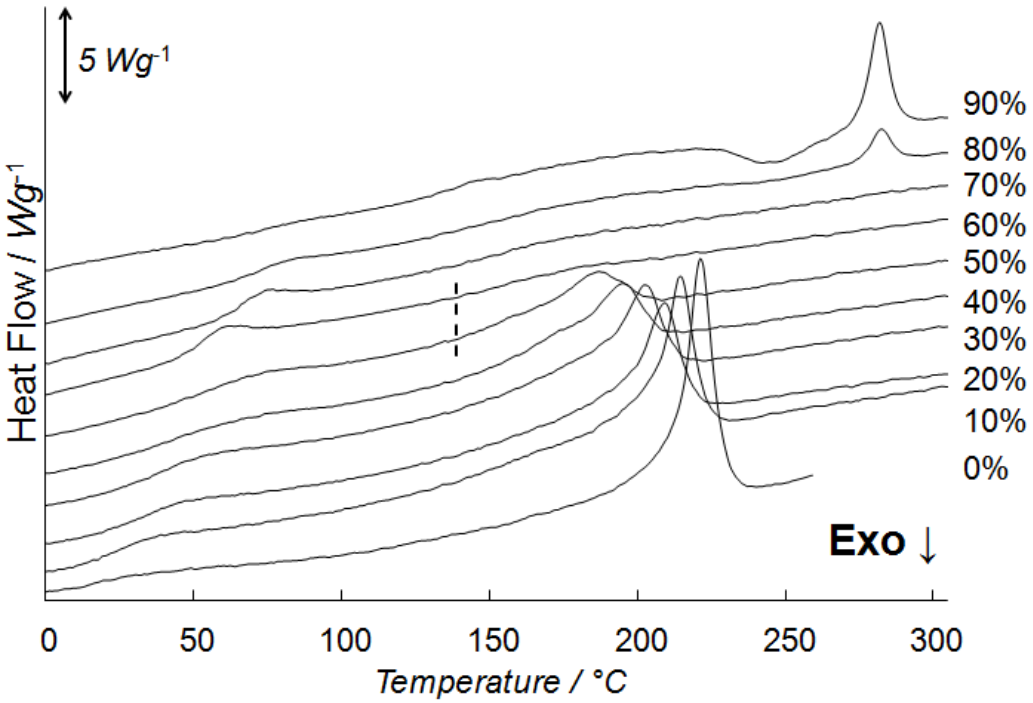

Figure S7: Thermograms of the sonicated P3HT-2:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

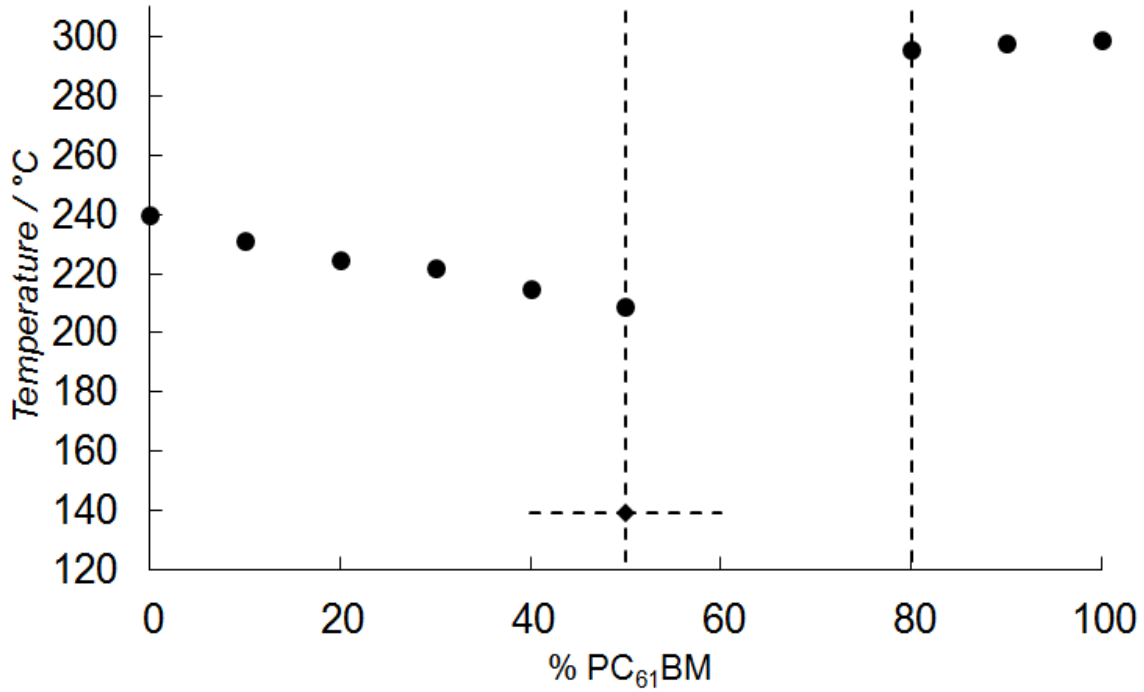

Figure S8: State diagram of sonicated P3HT-2:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

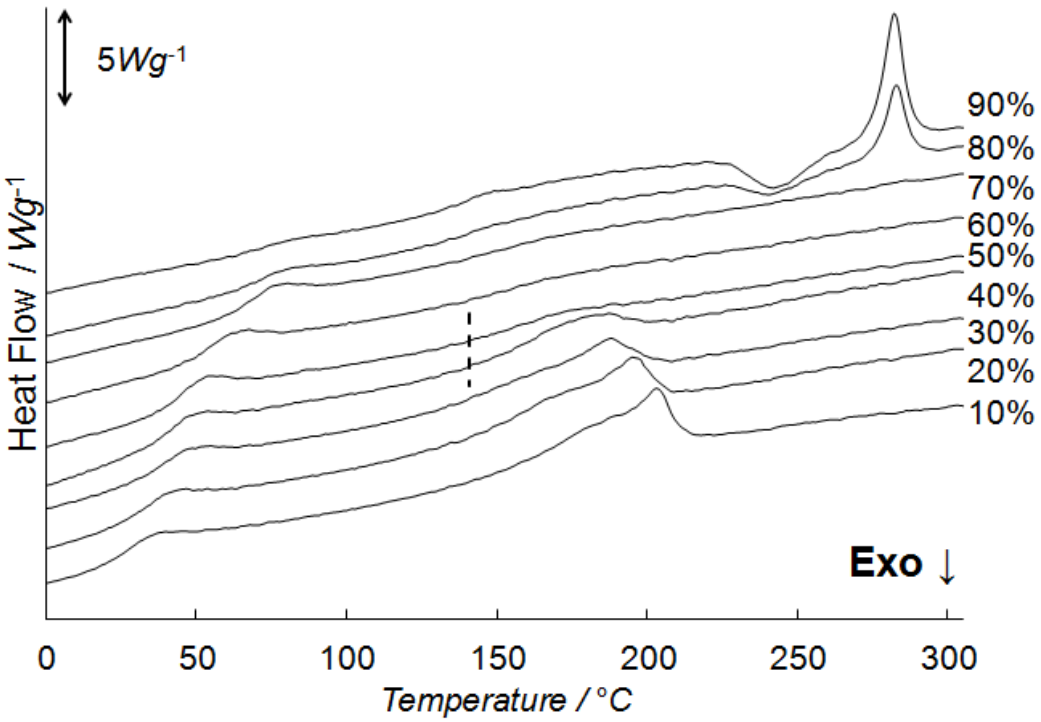

Figure S9: Thermograms of the sonicated P3HT-3:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

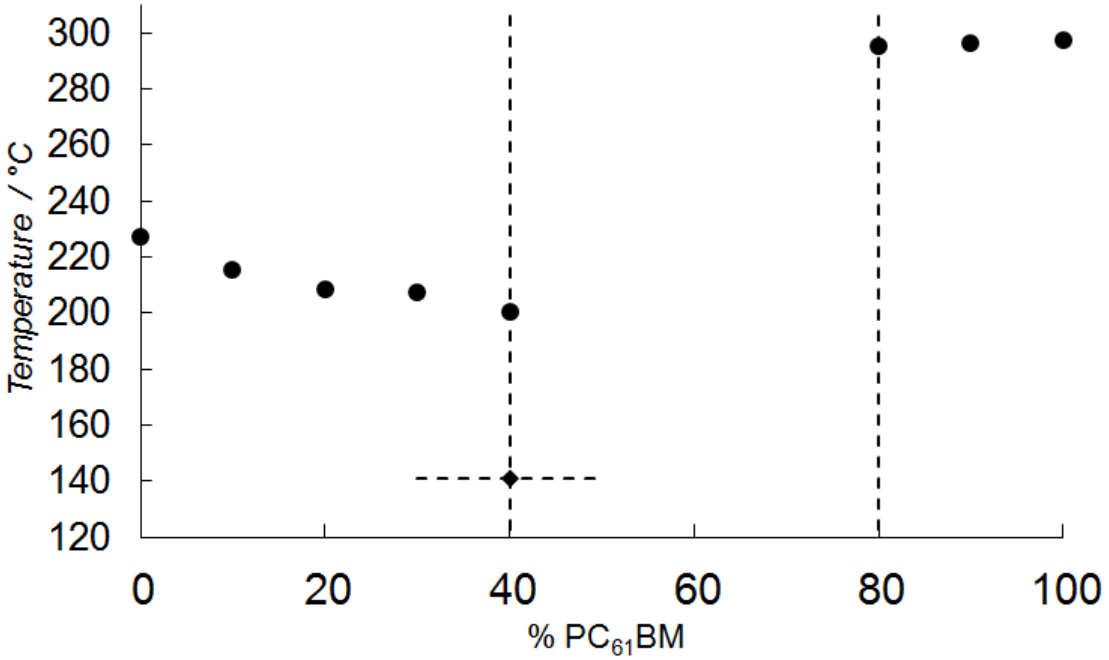

Figure S10: State diagram of sonicated P3HT-3:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

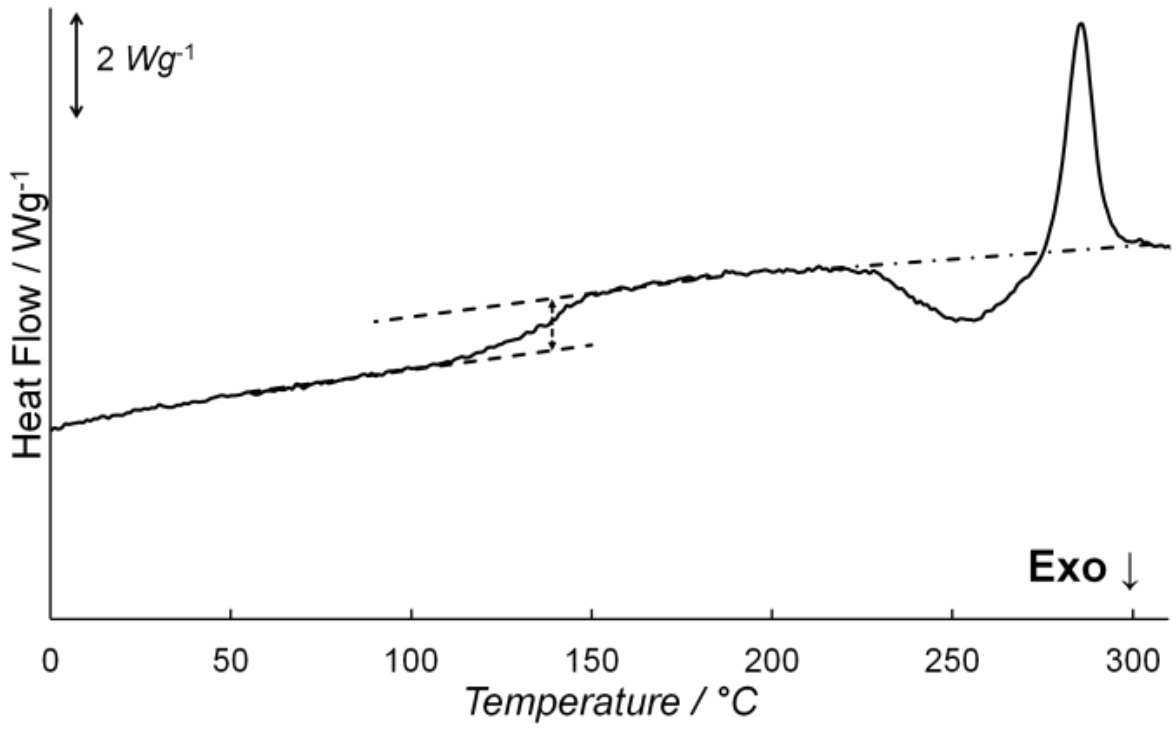

Figure S11: Thermogram of pure virgin $PC_{61}BM$ powder obtained at 500 K.min^{-1} after cooling at 500 K.min^{-1}. The glass transition is situated at 139 °C.

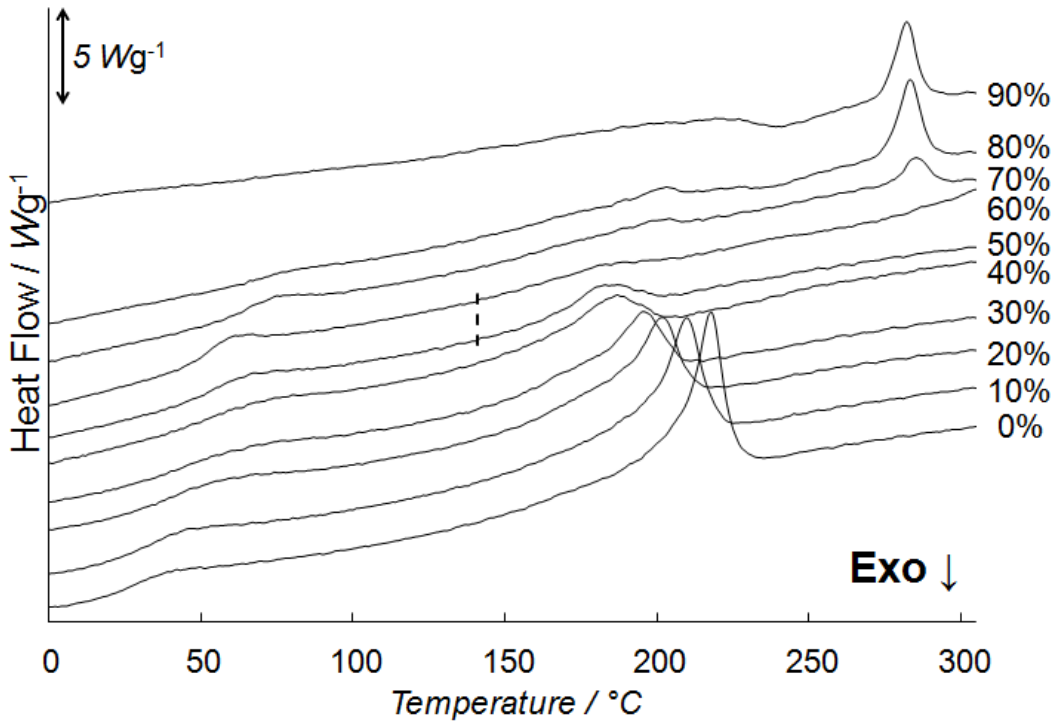

Figure S12: Thermograms of the not actively mixed P3HT-2:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

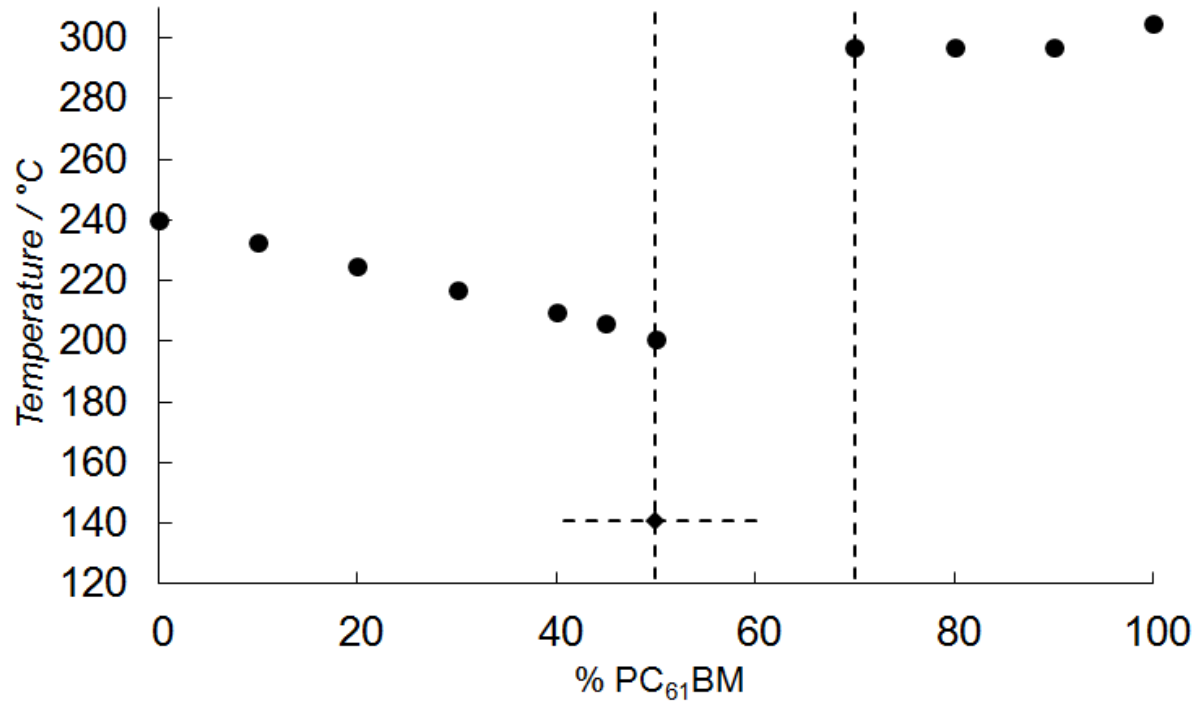

Figure S13: State diagram of not actively mixed P3HT-2:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

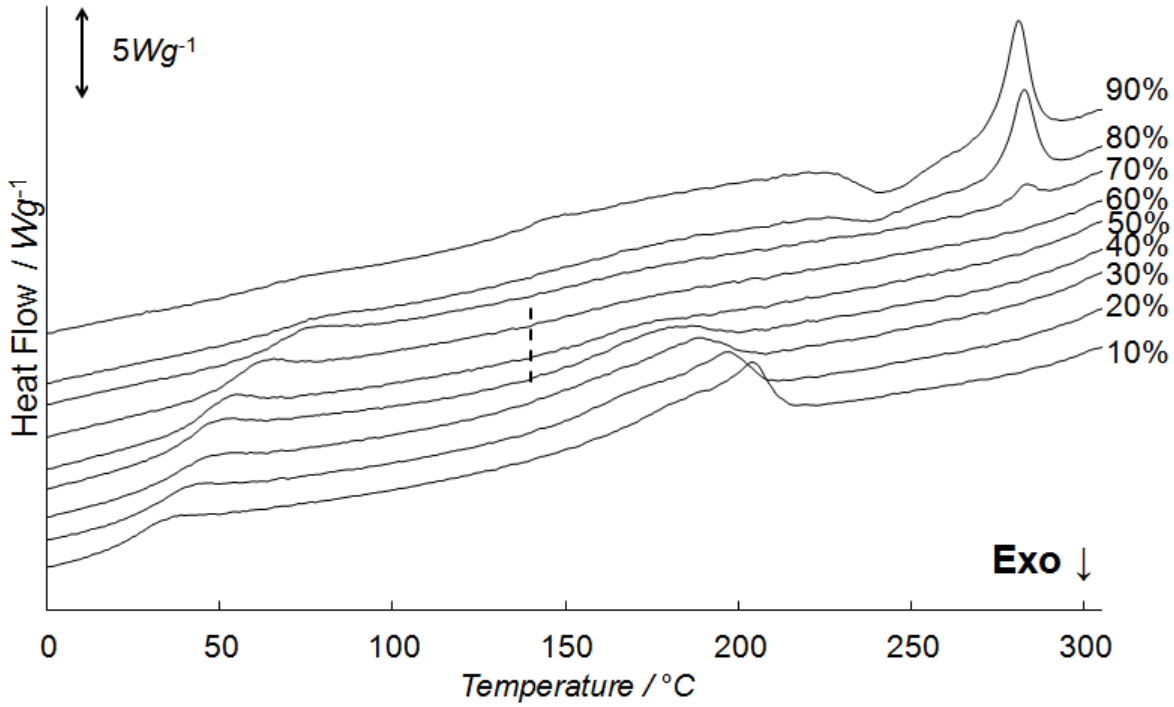

Figure S14: Thermograms of the not actively mixed P3HT-3:$PC_{61}BM$ mixtures. The vertical dashed line represents the onset of the melting peaks close to the eutectic. The wt% of $PC_{61}BM$ is indicated on the right side of the graph. The curves are shifted vertically for clarity.

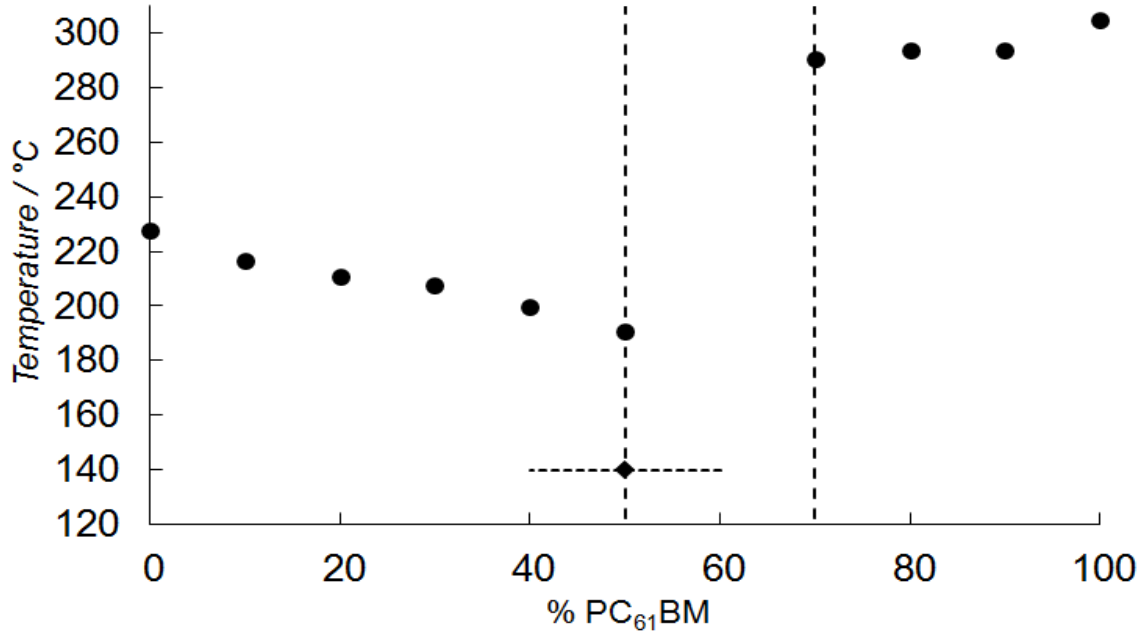

Figure S15: State diagram of not actively mixed P3HT-3:$PC_{61}BM$ mixtures. The vertical dashed lines represent the composition range of the eutectic. The horizontal dashed line in the state diagram represents the onset of melting around the eutectic composition.

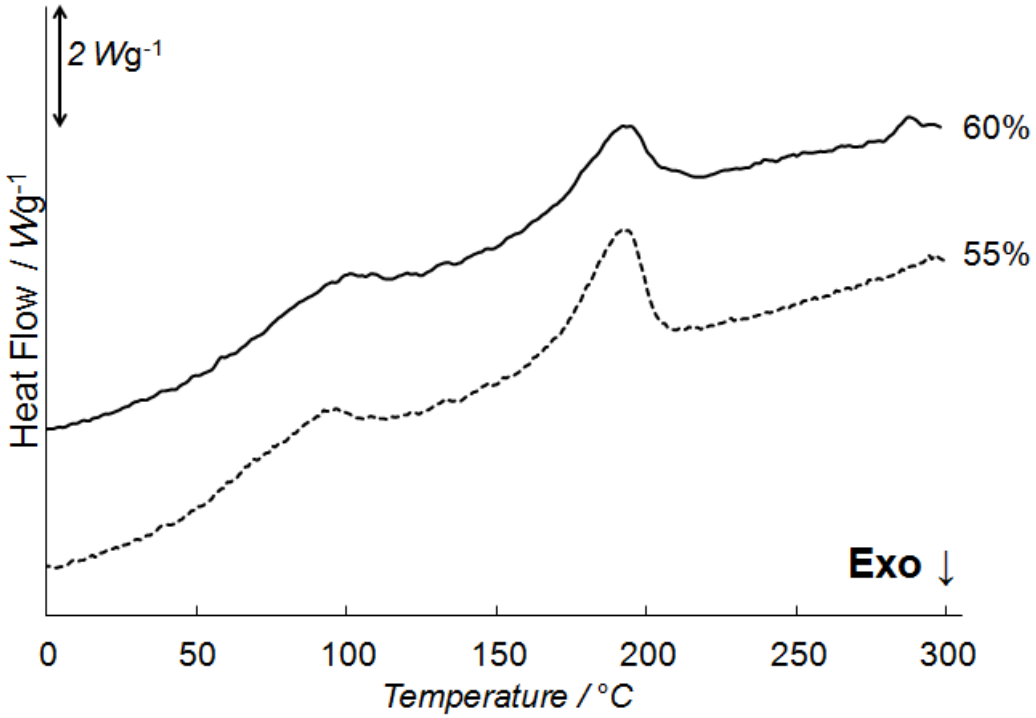

Figure S16: Thermograms of P3HT-2:$PC_{61}BM$ mixtures obtained without active mixing at 500 $K.min^{-1}$ after cooling at 1 $K.min^{-1}$. The 60 wt% $PC_{61}BM$ (full line) represents a mixture that is richer in $PC_{61}BM$ compared to the eutectic composition. The 55 wt% $PC_{61}BM$ (dashed line) represents a mixture that contains less $PC_{61}BM$ than the eutectic composition.