Title: Can a Combination of Poly(ethylene glycol) and Dense Phase Carbon Dioxide Improve Processing of Polylactide? A High Pressure Rheology Investigation.

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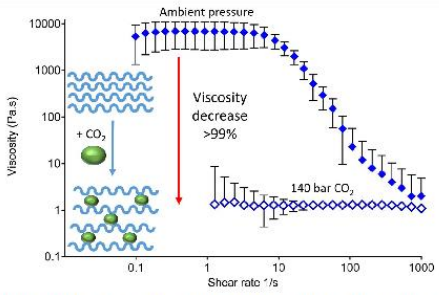
Graphical abstract



Carbon dioxide and excipient polymers such as poly(ethylene glycol) can be employed to dramatically reduce the viscosity of polymer melt blends and therefore enhance the mixing of thermally labile drugs into formulations for delivery devices.

Research highlights

- The viscosity of polymer melts at ambient pressure is very high ca. 6000 Pa.s for 10 kDa polylactide
- The addition of dense phase carbon dioxide significantly reduces melt viscosity by over 99%.
- The use of a polymer plasticiser such as poly(ethylene glycol) also reduces viscosity.
- Combining a plasticiser and CO_2 could allow polymer processing at much lower temperatures.