

Extrusion réactive, ou comment synthétiser des nouveaux matériaux polymères et nanocomposites dans des milieux non conventionnels

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One of the significant advantages of the extruder over batch reactors is to facilitate the continuous bulk reactive process, i.e. high viscosity solvent-free reactive systems. Actually, reactive processing combines the difficulties of polymer processing and the problems of controlling a chemical reaction in very specific conditions, high viscous medium ($\eta \sim 10^3$ Pa.s), high temperatures ($T \sim 250$ °C) and short residence times ($t \sim 1$ min). Many research works have been then devoted to reactive extrusion i.e. on using a twin screw extruder as chemical reactor and a number of reactive systems are concerned by reactive extrusion as for example : chemical modification of molten polymers, bulk polymerization, reactive blending of immiscible polymer blends by reaction at the interface, and in situ polymerization of a minor phase in a thermoplastic phase.

This presentation will focus on these last developments and more particularly on the in situ synthesis of organic polymer and inorganic phase inside a polymer matrix by reactive extrusion.

References

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2. V. Bounor-Legaré, P. Cassagnau, "In situ Synthesis of Organic-inorganic hybrids or Nanocomposites from Sol-Gel Chemistry in molten polymers". *Progress in Polymer Science* **2014**, 39(8), 1473–1497.

Note aux doctorants ED459 SCB "Sciences Chimiques Balard"

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