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**COMPARISON OF REACTIVELY COMPATIBILIZED POLYMER BLENDS PROCESSED IN A BATCH
MINI EXTRUDER AND IN A TWIN SCREW EXTRUDER**

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Blending polymers is mostly done by twin screw extrusion. However, using a batch mini extruder may be useful for exploratory development of new blends. Particularly, in case of reactive extrusion, this laboratory tool may allow us to control the residence time and therefore the reaction completion. Thus, it is of great interest to determine whether the results obtained with a batch mini extruder are comparable to a large scale extruder. The morphology, and more particularly the size of the domains, could be a good indicator of the reaction effectiveness. Therefore, we have compared the morphologies in immiscible polymer blends obtained in a twin screw extruder (diameter = 34mm, L/D ratio = 35) and in a batch mini extruder. The model system used for this study was Polyamide 6/High Density Polyethylene (PA6/HDPE) blends reactively processed with Maleic Anhydride grafted HDPE (MA-g-PE). Different blends were firstly processed by twin screw extrusion using fixed extrusion conditions (290°C, 250 rpm, 10 kg/h). The obtained morphologies were observed by Scanning Electron Microscopy (SEM) and the compatibilization reaction was characterized. Among these blends, various formulations exhibiting different morphologies (co-continuous, stretched dispersions and dispersions) were reproduced using the batch mini extruder with various process conditions (temperatures, screw speeds and residence times). The morphologies obtained with both processing tools were then compared. Inside a morphology domain, the composition seems to be the predominant factor. The process parameters seem to have an influence on the morphology only at the boundaries between two different morphology domains. In this case, our batch mini extrusion conditions for optimal comparison with the morphologies obtained in twin screw extrusion were determined: 290°C, 100 rpm and residence times from 2 to 4 minutes.