

## **Polyethylene ionomer based nano-composite foams prepared by a batch process and Mucell<sup>®</sup> injection molding**

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o understand the correlation between formability and melt rheology of polyethylene-based ionomers having different degrees of the neutralization and corresponding nano-composites, we have conducted the foam processing via a batch process in an autoclave and microcellular foam injection molding (FIM) process using the Mucell<sup>®</sup> technology. We have discussed the obtainable morphological properties in both foaming processes. All cellular structures were investigated by using field emission scanning electron microscopy. The competitive phenomenon between the cell nucleation and the cell growth including the coalescence of cell was discussed in light of the interfacial energy and the relaxation rates revealed by the modified classical nucleation energy and rheological measurement, respectively. The FIM process led to the opposite behavior in the cell growth and coalescence of cell as compared with that of the batch process, where the ionic crosslinked structure has significant contribution to retard the cell growth and coalescence of cell. The mechanical properties of structural foams obtained by FIM process were discussed.