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Cubic Ordering of Aggregates in Precise Phosphonic Acid Copolymers FRANCISCO BUITRAGO, University of Pennsylvania, KATHLEEN OPPER, KENNETH WAGENER, University of Florida, KAREN WINEY, University of Pennsylvania — Polyethylene-acid copolymers were synthesized by acyclic diene metathesis (ADMET) chemistry. The result is a series of strictly linear, high molecular weight polyethylenes with pendent acid groups separated by a precisely controlled number of methylene units. Previous studies have been focused on acrylic acid copolymers and ionomers. Here, we focus on phosphonic acid pendent groups in single and geminal architectures. The morphology of these materials has been studied by X-ray scattering at 25 and 150 ° C, along with transmission electron microscopy. For a geminal acid copolymer with low acid content, the precise molecular structure produces thermally persistent acid aggregates on a cubic lattice. This is the first report of cubic aggregate packing in polyethylene-acid copolymers.

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