

Elucidation of reaction process through halogen elimination in CuCN-mediated cyanation of (*E*)-1-bromo-2-iodoalkene

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ABSTRACT TEXT (Arial, 12 font, left aligned, maximum 250 words)

The previously unknown reaction process involved with metal-mediated beta-halogen elimination of vicinal (*E*)-dihaloalkene is described, including a description of stereo-defined synthesis of differentially all-carbon tetra-substituted olefins. We have researched a platform-synthesis of singly constructed tetrasubstituted olefins bearing four different carbon-linked groups on the basis of vicinal dihaloalkenyl scaffolds. We anticipated possibility of (*E*)-(1-bromo-2-iodo)arene as the synthetic scaffold: the iodine site might selectively undertake a vinylic Rosenmund-von Braun cyanation, then the bromine site would be subjected to the substitution reactions. Thus, we investigated optimized conditions of the cyanation; however, a side-reaction of halogen elimination terribly prevented the smooth installation of nitrile group. Finally, we isolated the corresponding acrylonitriles and determined the product structures on the basis of crystallographic analyses, and revealed that the reaction would form bifurcated paths. The two paths would start from vinyl Cu^{III} species, the species might flow into reductive elimination and halogen elimination: these two routes deliver the mixtures of products.