Our original goal was the designed synthesis and X-ray structure determination of neutral mixed-valence copper cyanide polymers with Cu$^{II}$ complexed with amine bases, and a Cu$^{I}$Cu$^{II}$CN framework. We determined the X-ray structures of a number of 1D, 2D and 3D mixed valence polymers of this type. Some syntheses, however, led to unexpected products that could not contain Cu$^{II}$ as they were colorless. X-ray structural analyses indicated anionic 2D or 3D Cu$^{I}$ networks with guest cations, and suggested further systematic study. By altering reaction conditions to produce intentionally more compounds of this type, we have characterized a number of new polymeric anionic CuICN structures, with charge neutrality obtained by various protonated guest amines and diamines. For instance, whereas crystallization of Cu(CN)$_x$ mixtures in the presence of N-ethylenediamine (eten) affords large blue crystals of Cu$_2$(CN)$_3$eten via air-oxidation, at lower pH we obtain colorless needles of [etenH][etenH$_2$][Cu$_4$(CN)$_7$] with the anionic CuCN framework shown. We will present the new structures and discuss how different bases can drive formation of different topologies for the CuCN frameworks.