Let $H$ be a finite dimensional pointed Hopf algebra with an abelian group $G$ of group-like elements, over a field $k$ which contains all the $n^{th}$ roots of 1, for $n = |G|$. We determine all possible actions of $H$ on matrices $M_m(k)$.

Our techniques use the classification of group gradings of matrices by Bahturin, Sehgal, and Zaicev.

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