

Abstract

The thesis deals with subsemigroups of $(\mathbb{N}_0^m, +)$, a special discussion is later devoted to the cases $m = 1$, $m = 2$ and $m = 3$. We prove that a subsemigroup of \mathbb{N}_0^m is finitely generated if and only if its generated cone is finitely generated (equivalently polyhedral) and we describe basic topological properties of such cones. We give a few examples illustrating that conditions sufficient for finite generation in \mathbb{N}_0^2 can not be easily transferred to higher dimensions. We define the Hilbert basis and the related notion of Carathéodory's rank. Besides their basic properties we prove that Carathéodory's rank of a subsemigroup of \mathbb{N}_0^m , $m = 1, 2, 3$, is less than or equal to m . A particular attention is devoted to the subsemigroups containing non-trivial subsemigroups of "subtractive" elements.