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Nicholas R. Baeth and **Roger Wiegand*** (rwiegand@unl.edu), 203 Avery Hall, University of Nebraska, Lincoln, NE 68588-0130. *Factorization theory and decompositions of modules.*

Let (R, \mathfrak{m}) be a Noetherian local integral domain and $\mathfrak{C}(R)$ the additive monoid of isomorphism classes of maximal Cohen-Macaulay R -modules (together with 0), with addition induced by the direct sum. We will make some general remarks about these monoids (they are, for example, always Krull monoids) and then specialize to the case $\dim R = 1$, where we know a great deal about their structure. We know, for example, that $\mathfrak{C}(R)$ is factorial if the completion \widehat{R} is an integral domain and usually (but not always) has infinite elasticity otherwise. (Received September 17, 2012)