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Unique factorisation of normal elements in polynomial rings. (English) Zbl 0662.16004
Proc. R. Soc. Edinb., Sect. A 110, No. 3-4, 241-247 (1988).

An element x of a ring S is normal if $xS = Sx$, and $N(S)$ denotes the set of non-zero normal elements of S . From now on let R be a prime left and right Noetherian ring in which every non-zero ideal contains a non-zero normal element, and let R^* be the ring of polynomials over R in one indeterminate. It is difficult to determine the elements of $N(R^*)$ beyond saying that $N(R^*)$ contains the graded normal elements of R^* , i.e. those elements f of R^* such that $fR = Rf$. This problem arises when trying to answer the following open question: If $N(R)$ satisfies the unique factorisation property, is the same true for $N(R^*)$? The author shows that the answer is "Yes" if R is an integral domain or if R has an infinite central subfield. In general it is shown that if $N(R)$ has unique factorisation, then $N(R^*)$ has unique factorisation if and only if every element of $N(R^*)$ is an associate of a graded normal element of R^* .

Reviewer: [A.W.Chatters](#)

MSC:

[16N60](#) Prime and semiprime associative rings
[16P40](#) Noetherian rings and modules (associative rings and algebras)
[16U10](#) Integral domains (associative rings and algebras)

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