**Jordan, D. A.**

**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)



**Keywords:**

normal elements; prime left and right Noetherian ring; ring of polynomials; graded normal elements; unique factorisation

**Full Text:** DOI

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