n-Algebras admitting a multiplicative basis

José M. Sánchez Delgado
CMUC - Centro de Matemática da Universidade de Coimbra, Portugal

Abstract

Let A be a n-algebra of arbitrary dimension and over an arbitrary base field $\mathbb{F}$. A basis $B = \{e_i\}_{i\in I}$ of A is multiplicative if for any $i_1, \dots, i_n \in I$ we have either

$$\langle e_{i_1}, \dots, e_{i_n} \rangle = 0 \text{ or } 0 \neq \langle e_{i_1}, \dots, e_{i_n} \rangle \in \mathbb{F}e_j$$

for some (unique) $j \in I$.

We show that if A admits a multiplicative basis then it decomposes as the direct sum

$$A = \oplus_{i\in I} A_i,$$

of well-described ideals admitting each one a multiplicative basis. Also the minimality of A is characterized in terms of the multiplicative basis and it is shown that, under certain conditions, the above direct sum is by means of the family of its minimal ideals admitting a multiplicative basis.