

# Applications of the group identities theory to the group of units of group algebras

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Recent progress in the theory of group identities made it possible to achieve new results in the theory of the group of units  $U(FG)$  of the group algebra  $FG$ :

**1.** Let  $F$  be a field of characteristic  $p$ , and  $G$  a group having a nontrivial  $p$ -Sylow subgroup  $P$ . Then  $U(FG)$  is a bounded Engel group if and only if  $G$  is a nilpotent group with a normal subgroup  $H$  of  $p$ -power index such that the commutator subgroup of  $H$  is a finite  $p$ -group, and in this case  $FG$  is a bounded Engel algebra.

**2.** A description is given of the structure modular group algebras  $FG$  of characteristic  $p$  whose group of units  $U(FG)$  is a solvable group. In particular, assume that a nonabelian group  $G$  with a nontrivial  $p$ -Sylow subgroup  $P$  is such that if  $G$  is a non-torsion group, then  $P$  is infinite. If  $p > 3$  then  $U(FG)$  is a solvable group if and only if either the commutator subgroup  $G'$  is a finite  $p$ -group, and in this case  $FG$  is a Lie solvable algebra.