

Finite rings with homocyclic p -groups as Sylow p -subgroups of the group of units
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Abstract

In 1960, Laszlo Fuchs posed, among other problems, the following: characterize the groups which are the groups of all units in a commutative and associative ring with identity. Though this problem still remains open, attempts have been made to solve it for various classes of groups, where the rings are not assumed to be commutative. In this paper, we focus on a slightly weaker version of Fuchs' problem by determining completely primary finite rings whose unit groups have homocyclic Sylow p -subgroups with prime power exponents. We further investigate the constraints on the rings with no homocyclic Sylow p -subgroups of the unit groups.