ON $\mathfrak{F}$-COVERING SUBGROUPS IN FINITE GROUPS

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Let π be a set of primes. By S.A.Chunikhin [1], a finite group G is called π-selected if the order of its every chief factor is divided by not more than one number from π. We extend this definition in the following way. We say that a finite group G is E_π^n-selected if every subgroup of any chief factor of G has a nilpotent Hall π-subgroup. Clearly, every E_π^n-selected finite group is π-selected. S.A.Chunikhin proved that every finite π-selected group has exactly one conjugacy class of Hall π-subgroups. We generalize this result in terms of the formation theory.

Let $\mathfrak{F}$ denotes a class of finite groups. According to Gaschütz's definition, an $\mathfrak{F}$-covering subgroup H of a finite group G is defined by the properties:
(i) $H \in \mathfrak{F}$, and
(ii) whenever $H \subseteq U \subseteq G$ and $K \trianglelefteq U$ such that $U/K \in \mathfrak{F}$, then $U = HK$.

Theorem. *Let $\mathfrak{F}$ be a non-empty saturated formation of finite groups. Then each finite E_π^n-selected group possesses exactly one conjugacy class of $\mathfrak{F}$-covering subgroups.*

Corollary 1. *Let $\mathfrak{F}$ be a non-empty saturated formation of finite groups. Then each π-selected finite group possesses exactly one conjugacy class of $\mathfrak{F}$-covering subgroups.*

Corollary 2(W. Gaschütz [2]). *Let $\mathfrak{F}$ be a non-empty saturated formation of finite groups. Then each soluble finite group possesses exactly one conjugacy class of $\mathfrak{F}$-covering subgroups.*

References

1. S.A.Chunikhin, Subgroups of finite groups, Minsk: Nauka i tekhnika, 1964.

2. W.Gaschütz, Zur Theorie der endlichen auflösbaren Gruppen, *Math. Z.*, **80**, N 4, 300–305 (1963).