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On the Baer–Suzuki Width of Some Radical Classes

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Abstract—Let $\sigma = \{\sigma_i \mid i \in I\}$ be a fixed partition of the set of all primes into pairwise disjoint nonempty subsets σ_i. A finite group is called σ-nilpotent if it has a normal σ_i-Hall subgroup for any $i \in I$. Any finite group possesses a σ-nilpotent radical, which is the largest normal σ-nilpotent subgroup. In this note, it is proved that there exists an integer $m = m(\sigma)$ such that the σ-nilpotent radical of any finite group coincides with the set of elements x such that any m conjugates of x generate a σ-nilpotent subgroup. Other possible analogs of the classical Baer–Suzuki theorem are discussed.

Keywords: Baer–Suzuki width, σ-nilpotent group, σ-solvable group, complete class of groups.

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