

Anderson, D. D.; Smith, Eric**Weakly prime ideals.** (English) [Zbl 1086.13500](#)

Houston J. Math. 29, No. 4, 831-840 (2003).

Summary: Let R be a commutative ring with identity. We define a proper ideal P of R to be weakly prime if whenever $0 \neq ab \in P$ then either $a \in P$ or $b \in P$. For example, every proper ideal of a quasilocal ring (R, M) with $M^2 = 0$ is weakly prime. We show that a weakly prime ideal P that is not prime satisfies $P^2 = 0$, in fact, $P\text{nil}(R) = 0$. A number of results concerning weakly prime ideals and examples of weakly prime ideals are given. We show that every proper (principal) ideal of R is a product of weakly prime ideals if and only if R is a finite direct product of Dedekind domains (locally factorial Krull domains) and SPIR's or (R, M) is a quasilocal ring with $M^2 = 0$.

MSC:**13A15** Ideals and multiplicative ideal theory in commutative rings**13H99** Local rings and semilocal rings

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