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"Mangel an Beweisen" wirkt in Mathe nicht strafmildernd!
Rainer Rosenthal, d.s.m

Nasser

Solve in Mathematica will return {} if there are no solutions to a polynomial system. For systems that are not polynomial in the given variables it may return {} in cases where it finds no solutions even if some might exist. The function Reduce tends to be more clever about this, at least for some classes of transcendentals e.g systems of trigs or exponentials.

Getting back to the specific question by C. Creutzig, the case of {} when solutions actually exist is indeed a form of failure. Most commonly Solve will give an outright "transcendental dependency detected" message and return unevaluated. But there are cases where Solve manages a polynomial reformulation, unwinds in terms of (multi-valued) inverse functions, misses valid solutions, and ends up with noting but parasite solutions (or, in this case, a valid solution it is unable to properly verify). In such cases the final result will be {}. There are warning messages to the effect that inverse functions are used and solutions might be lost, so I don't see this as a particularly serious shortcoming.

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