Waring's Problem with digital restrictions

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Waring's Problem, conjecturing that every integer N can be represented as sum $N = n_1^d + \ldots + n_s^d$ of a sufficiently large number of powers of other integers, is investigated subject to so-called digital restrictions. That is, the indeterminates n_1, ..., n_s simultaneously obey a condition involving the q-adic sum of digits function S_q. Given N, s, d and q, we provide a Hardy-Littlewood like asymptotic formula for the number of such representations of N, from which the fact that the corresponding set of integers forms an asymptotic basis can be easily derived.

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