On the number of nonzero digits of smooth numbers

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Let $x \geq 2$ be a real number. Then an integer $n \geq 1$ is called x-smooth if every prime factor of n is at most x. For instance, if $a \geq 2$ is an integer, then a^n $(n = 1, 2, \ldots)$ are a-smooth. Stewart gave lower bounds for the numbers of nonzero digits in the base-b expansions of a^n $(n = 1, 2, \ldots)$ in the case where $a \geq 2$ and $b \geq 2$ are multiplicatively independent integers. Bugeaud raised the question of the existence of arbitrarily large smooth numbers having few nonzero digits. It is conjectured that the answer is no. In this talk, giving lower bounds for the numbers of nonzero digits of smooth numbers, we give new results on the conjecture. This is a joint work with Yann Bugeaud.