The effectiveness of a catalyst particle with diffusion and first-order reaction is governed by a parameter proportional to the 'size' of the particle. If that size is taken to be the ratio of the volume to external surface area, the effectiveness factors for all particle shapes come together asymptotically and are reasonably close together over the whole range. (The SCI® indicates that this paper has been cited over 145 times since 1961.)

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"The main idea of this paper arose when I was working at the (then) Billingham Division of Imperial Chemical Industries in 1952. I had been seconded to the catalyst section to study methods of catalyst testing and quickly ran into the problem of diffusion limitation. A remarkable mathematical physicist, C.H. Bosanquet, was at Billingham at the time, who, when asked if a particular reaction were limited by diffusion, would enquire as to the conditions and then wander around his almost bare office muttering about orders of magnitude followed by one of the Rhodesian Ridgebacks he brought into work. From time to time he would press the top of his head against the wall and come up with a 'scarcely,' 'somewhat,' or 'severely.' Whilst this was great fun and very impressive (for a later mathematician), it was not until 1965 that the ultimate normalisation of the Thiele modulus, accounting for the kinetics as well as the shape, was published, independently and almost simultaneously, by Bischoff, Petersen, and myself (mention of this is made on page 41 of reference 3). The most recent citation of the paper (or rather of its result as given in reference 3) is by Yortsos and Tsotsis,6 who generalize the result for particles with varying activity."