# Dead-core solutions to simple catalytic reaction problems in chemical engineering

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The diffusion-reaction problems with non-Lipschitz kinetics can exhibit dead-cores whose location is of big importance in chemical reactor engineering [1,2]. Recently, core-shell catalysts have been successfully applied for industrially important reactions such as Fischer-Tropsch [3] and steam methane reforming for hydrogen production [4]. In the discussed simplified diffusion-reaction problem we encounter a nonlinear term of power-law type which represents a strong absorption due to the catalytic reaction. We present the ways how to calculate the exact solutions possessing dead-cores and their numerical approximations based on collocation method in the case of plain, spherical and cylindrical geometries [5].

**Acknowledgements**

This research was supported in part by a research grant No.090118FD5347 from Nazarbayev University.

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