Guiding zeolite synthesis towards target frameworks and selective active site allocation: catalytic implications

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Resumo/Abstract

Zeolites are crystalline microporous materials with application in diverse fields, especially in catalysis. The ability to prepare zeolites with adequate physicochemical properties for a specific catalytic application is a matter of great interest, because it allows the efficiency of the entire chemical process to be increased. Nevertheless, directing the zeolite crystallization towards the material with the desired framework topology, crystal size, or chemical composition is not trivial, since several variables influence the nucleation and crystallization processes.

Herein, recent relevant advances on the design of zeolite-based catalysts will be presented and discussed, where innovative rationalizations will permit guiding towards molecular and atomic control to generate the precise metal active sites and maximize the stabilization of the key intermediates (see Figure 1).[1-5] These rationalized target zeolites will be applied as efficient catalysts in diverse environmental and industrial processes.

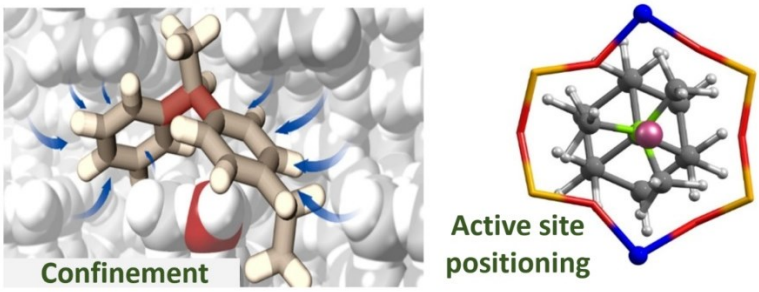

Figure 1. Different synthesis strategies to maximize confinement and active site positioning in zeolite-based catalysts

References

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