

How does the surface of an operating catalyst look like? Approaches by high-pressure scanning tunneling microscopy



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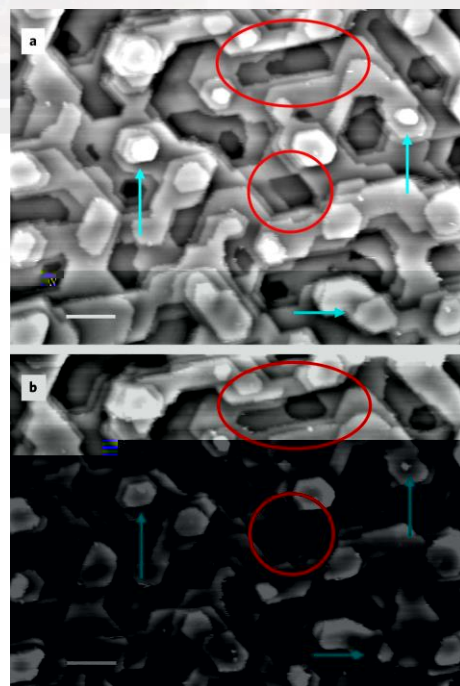
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Abstract:

What we know about the processes on catalyst surfaces mainly stems from indirect information and from modelings of the reaction kinetics. Scanning tunneling microscopy (STM) is one of the few surface analytical techniques that can be applied at high pressures, so that it could, in inciple, provide access to the atomic structure of the surfaces of operating catalysts. However, the number of examples where this has actually been achieved has remained low, a result of many practical, experimental difficulties. In this talk, I present results of a project to solve some of these difficulties. As an example, I discuss the Co-catalyzed Fischer-Tropsch synthesis, a large-scale industrial process to produce liquid hydrocarbons from mixtures of CO and H₂ (syngas). After major efforts we finally managed to image the surface under reaction conditions and identify the active sites.



References

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