A new paradigm in catalyst design: the role of nano-structuring

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The lecture will outline a theory of heterogeneous catalysis that allows a detailed understanding of elementary chemical processes at transition metal surfaces and singles out the most important parameters determining catalytic activity and selectivity. It will be shown how scaling relations allow the identification of descriptors of catalytic activity and how they can be used to construct activity and selectivity maps. The maps can be used to define catalyst design rules and examples of their use will be given.