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Preface

"Particle size is crucial in catalysis"—this statement has been known much earlier than the term of /nano/ became trendy. The particular reactive properties of the catalyst nano-particles are attributed to appreciable number of constituent atoms, which are coordinatively unsaturated or are in contact with the support, and to size-dependent electron confinement effects. Representative example is the case of gold, considered as inactive: nowadays it has been proven that by reducing the dimensions to Au nano-clusters it becomes a very effective catalyst. In some cases of supported catalysts the size of support particles can also be important.

The growing demand for improving selectivity in chemical synthesis to meet the increasingly stringent ecological standards requires new technologies based on highly effective and selective catalysts. To satisfy this demand the current combinatorial techniques enabling optimisation of elemental composition are not sufficient and much more scientific bottom-up approach to tailoring of the catalytic activity and selectivity is required. The predicted future for nano-catalysts is very promising: the worldwide market is foreseen to increase from $3.7 bn in 2004 to $5 bn in 2009.

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