**Single-atom catalyst: a new frontier in heterogeneous catalysis**

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Heterogeneous catalysts are critical to energy production, pollution control, and fine chemical synthesis. Supported metal catalysts are among the most important heterogeneous catalysts. The efficiency of such catalysts as used in industry is, however, extremely low on a per metal atom basis, because only the surface active site atoms are used. Metal catalysts with single-atom dispersion, which we define as the single-atom catalysts (SACs),1,2 are thus highly desirable to maximize the atom efficiency. In the past five years, SACs have emerged as a new frontier in heterogeneous catalysis, and shown distinctive performances in a series of oxidation and hydrogenation reactions.3-15 In this presentation, I will show the new advances in SACs. The Challenges and perspectives in SACs will be briefly highlighted.

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