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**Wednesday, May 20, 2015**  
**La Quinta Inn & Suites, Somerset, NJ**

**2015 Excellence in Catalysis Award Lecture**

**Wen-Mei Xue**  
BASF Corporation  
25 Middlesex Essex Turnpike, Iselin, NJ 08830

### **Cu-CHA Selective Catalytic Reduction (SCR) Catalyst for Automotive Exhaust Clean-up**

Increasingly stringent emission legislations, such as US 2010 and Euro VI, for heavy duty diesel vehicles required the use of selective catalytic reduction (SCR) technologies with high efficiency and durability. Before the Cu-chabazite SCR catalyst was discovered, the existing SCR technologies lacked in either the low temperature NO<sub>x</sub> reduction activity or the hydrothermal stability. Extensive efforts of BASF scientists to improve low temperature catalytic activity of SCR catalysts and to enhance the catalysts durability led to the discovery of Cu-chabazite. The initial BASF SCR team was comprised of a small group of scientists (Ivor Bull, Wen-Mei Xue, Patrick Burk, Samuel Boorse, William M. Jaglowski, Gerald S. Koermer, Ahmad Moini, Joseph A. Patchett, Joseph C. Dettling, and Matthew T. Caudle) with expertise in heterogeneous catalysis and material science. This breakthrough SCR catalyst was covered in US Patent 7,601,662, "Copper Chabazite Catalysts". Cu-CHA SCR demonstrated the highest low temperature NO<sub>x</sub> reduction activity and the highest hydrothermal stability over the earlier SCR technologies. This market disrupting technology allowed BASF's customers to meet stringent emission limits for NO<sub>x</sub> from diesel engines around the world, such as the US 2010 Highway Diesel Rule and Euro 6 emission regulations. Once the value of this technology was recognized, the initial core SCR team quickly expanded to a global cross-functional team aimed at growing the processes to manufacturing scale beginning with the zeolite structure-directing agent, synthesis of the chabazite zeolite, conducting the copper ion-exchange, and finally coating the copper chabazite onto monolith substrates.

The presentation will cover the discovery and development of Cu-chabazite SCR catalyst, its unique properties and activities, and its wide applications in the exhaust aftertreatment systems of diesel and lean-burn gasoline engines.