

Cover Picture

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The cover picture shows an arrangement of ruthenium atoms representing the active site of ruthenium catalysts for ammonia synthesis. This B₅-type active site consists of three ruthenium atoms in one layer (blue spheres) and two ruthenium atoms in the layer directly above this (red spheres). This arrangement is energetically preferred, because none of the ruthenium atoms is in contact with both of the nitrogen atoms (green spheres) of the adsorbed N₂ molecule. Based on knowledge of this active site a number of catalysts were prepared by using [Ru₃(CO)₁₂] (upper green sphere) as a precursor. These catalysts were characterized (left red sphere and TEM micrograph in the background), tested using a parallel screening procedure (left and lower blue spheres), and kinetically analyzed (right blue sphere). The resulting barium-promoted Ru/MgO catalyst is the most active catalyst for ammonia synthesis to be described (right red sphere). It can be concluded that the B₅-type site also dominates the activity of the promoted catalysts (lower green sphere). The enormous catalytic potential of Ba-Ru/MgO is described by Muhler et al. on pp. 1061 ff.

