Zirconium oxide nitrides are active ammonia decomposition catalysts for the production of hydrogen. We present a route to zirconium oxide nitrides with high surface area. The precursor used consisted of a high-surface-area silica material coated with zirconium alkoxide. Subsequent hydrolysis and calcination resulted in ZrO$_2$ supported on SiO$_2$. The high surface area of the material could be maintained in the following ammonolysis procedure leading to the corresponding zirconium oxide nitride. In contrast to the as-prepared ZrO$_2$, the zirconium oxide nitrides exhibited a significant catalytic activity in ammonia decomposition, but compared to an iron oxide-based reference material, the new oxide nitrides showed a rather low activity. Nevertheless, zirconium oxide nitrides constitute suitable model systems for elucidating the effect of nitrogen in the anion substructure on the activity and selectivity of oxide-based ammonia decomposition catalysts.

**Key words:** Zirconium Oxide Nitride, Ammonia Decomposition, Catalysis