

## Challenges for Magnetic Materials in Vehicle Electrification

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A fundamental transformation of the transportation sector in the United States is underway. In parallel with advances in renewable energy resources for power generation, the rising use of electric and hybrid vehicles is reshaping the future of transportation. Similar efforts are moving forward for more-electric ships, aircraft, and other military technologies. Due to their prevalence, magnetic materials play an important role in improving the efficiency and performance of devices in electric power generation, conditioning, and conversion. However, additional challenges exist for magnets used in transportation applications, where enhanced reliability, power density, and overall energy capacity are increasingly important. This talk will focus on hard and soft magnetic materials, with an emphasis on their design and optimization for future power electronics and electric drives for vehicles. Specifically, the impact of hard magnetic materials on electric motor/generator technologies and of soft magnetic materials on electricity generation/conversion technologies will be presented. The structure-property relationships that allow these advanced materials to provide greater performance will be discussed in terms of and their potential impact on future power electronics and electric drives for vehicles.

### References:

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