

**Abschlussarbeit Bachelor/Master:**  
**Synthesis and characterization of reduced graphene oxide / SiCN nanocomposites ceramic**

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Sprache: English

Advanced monolithic ceramics have attractive properties like high stiffness, strength, stability at high temperatures, making them useful for biomedical, electronic, automotive, industrial, defense and space applications. However, monolithic ceramics tend to be brittle, mechanically unreliable and poor electrical conductor, which limits their use. Meanwhile graphene has remarkable mechanical properties, which makes it potentially a good reinforcement in ceramic composites. It also has unique electrical and thermal properties, which makes it an attractive filler for producing multifunctional ceramics for a wide range of applications.

The main objective of this work is to synthesize a multifunctional Si-C-N composite ceramic through a polymer / graphene oxide composites pyrolysis. XRD, IR as well as Raman spectroscopy are employed to characterize the structure of the nanocomposites. SEM and TEM images are recorded in order to analyze the microstructure of the material. Thermal gravimetric analysis providing information on the cross-linking mechanism during pyrolysis.

The electrical conductivity as well as dielectric properties are to be explored in the end.

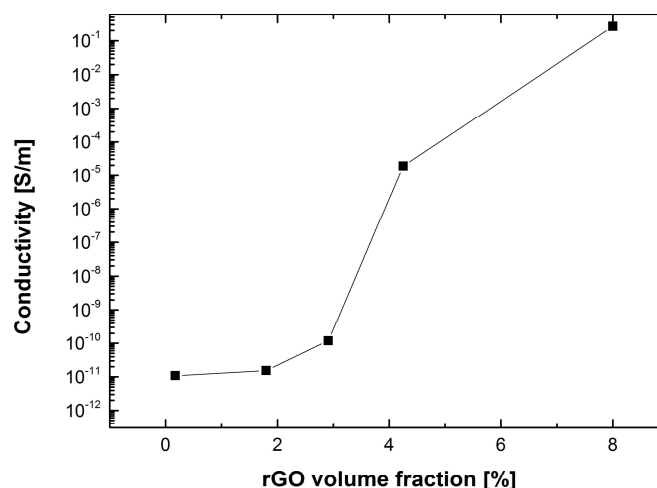


Figure 1 The DC conductivity of the composites has increased 10 orders of magnitudes at 8 vol. % of reduced graphene oxide

### Methods

- Polymer derived ceramics
- Pyrolysis of composites

### Characterization

- XRD, FT-IR, Raman
- SEM, TEM, TGA
- Electrical conductivity, dielectric properties