

SP10. ELECTROSPUN CERIA NANOFIBERS FOR DIESEL SOOT FILTRATION

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This poster discusses the production of doped ceria nanofibers via electrospinning and the influence of production parameters on the outcome of the manufactured nanofibers. According to the World Health Organization, diesel car emissions, diesel soot, are linked to hundred thousands of deaths every year. Diesel particulate filter have been introduced in the 1980s to mitigate the air pollution challenge, as well as strict governmental emission control measures for new automotive applications. Modern diesel particulate filter use catalysts to burn captured hydrocarbons with the temperature given by the exhaust stream. Currently, cylindrical honeycomb filters with platinum as catalyst are used to capture and burn the diesel soot. This method is costly on the material side as well as not efficient enough in overall filtration efficiency. To increase filtration efficiency, the usage of nanofibrous materials with ceria as main catalytic component can be used. The production of ceria based nanofibers has been conducted with electrospinning, using Polyvinylpyrrolidone as transport polymer, different tip-to-collector distances, voltages and different concentrations of $\text{Ce}(\text{NO}_3)_6 \cdot 6\text{H}_2\text{O}$ in ethanol and water. The created fiber mats were analyzed with FE-SEM imaging before and after calcining at $550\text{ }^\circ\text{C}$ in different atmospheres. The results of this research helps understanding the processing conditions needed to manufacture ceria-based nanofibers for practical application as well as production restrictions.