

ET 009
Evaluation and Optimization of Thermal-optical Methods for Measuring Organic and Elemental Carbon Using Different Analysis Protocols

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Abstract

The proposed research contributes to the base of knowledge required to improve PA air quality and develop more cost effective regulations by helping to establish RJ Lee Group (a small materials characterization company headquartered in Monroeville) as a service provider and innovator in the area of aerosol composition analysis.

In 1997 US EPA designated a new air quality standard for fine particulate matter mass or PM_{2.5} in response to evidence that indicates that fine particles cause significant human health effects. Unfortunately the impact of elemental carbon on human health and the environment is not well understood in part because of the large uncertainties (as much as a factor of 2) in elemental carbon measurements. Because the majority of the population of PA will likely live in areas that exceed the new EPA PM_{2.5} standard, the cost to Pennsylvanians and Pennsylvania companies to meet these standards will be in the tens of millions of dollars per year. Development of cost effective control strategies requires a better understanding of source contributions to PM. The current uncertainty surrounding elemental carbon measurements clouds our understanding of the contribution of diesel emissions to air quality problems. The proposed research will help clarify these uncertainties and allow for the development of more cost effective regulations.