

CHARACTERIZATION OF EXHAUST EMISSION PARTICULATE MATTER BY TRANSMISSION ELECTRON MICROSCOPY

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Our goal was to apply the techniques of transmission electron microscopy (TEM) and energy dispersive X-ray spectroscopy (EDS) to the analysis of the microstructure, morphology and microchemical composition of particulate matter from motor vehicle exhaust. Source sampling from a variety of vehicles was conducted. As part of an on-going research project into the health effects of motor vehicle particulate matter, Southwest Research Institute (SwRI) is performing chassis dynamometer tests in order to collect PM for chemical and toxicity studies. Samples from

these tests were collected on 3 mm diameter TEM grids placed on the various stages of a MOUDI im-paction device. The collected PM were analyzed for elemental chemical composition, crystallinity or lack thereof, and morphology. Analysis of the similarities and difference among mobile PM sources such as light-duty gasoline powered vehicles and light-duty diesel vehicles may provide insight into the formation mechanisms and health effects of particulate matter.