

IN VITRO GENOTOXICITY OF GASOLINE AND DIESEL ENGINE VEHICLE EXHAUST PM2.5 PARTICULATE AND SEMI-VOLATILE ORGANIC COMPOUND MATERIALS

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Three categories of *in vitro* genotoxicity were measured for acetone extracts of exhaust materials from a set of gasoline-engine automobiles and from a set of diesel-engine autos or light trucks supplied by a vehicle exhaust studies program sponsored by the U.S. Department of Energy. Acetone-washed filter samples of exhaust particulate matter with equivalent aerodynamic diameter less than 2.5 micrometers and XAD resin-sorbed semi-volatile organic compounds (SVOC) sampled at 72°F from modern, in-tune vehicles operated on the "Unified Driving Cycle" for light-duty vehicles were provided to the National Institute for Occupational Safety and Health (NIOSH) of the Centers for Disease Control and Prevention.

These samples were prepared for assay by filtration, evaporation, and re-suspension in TWEEN-80. National Institute of Standards and Technology Standard Reference Material 1650a was similarly treated and assayed. Mutagenicity testing *in vitro* used the *Salmonella typhimurium* histidine reversion micro-suspension assay with tester strains YG1024 and YG1029, with and without S9 microsomal activation of samples. Each sample preparation was tested at four or more concentrations, with duplicate tests at each concentration, and with a repetition of the entire experiment. Micronucleus induction assay for chromosomal damage used Chinese hamster lung fibroblasts (V79 cells), which were challenged for 24 hours, and 3000 cells from each treatment were scored for micronucleated cells. The single cell, gel-electrophoresis assay (SCGE) for DNA migration was used as a measure of DNA single- and double-strand breaks in V79 cells challenged for 24 hours. Each sample preparation was tested at four or five concentrations.

Results are presented for gasoline vehicle PM2.5, gasoline vehicle SVOC, diesel PM2.5, and diesel SVOC for the three sets of genotoxicity tests with dose expressed in terms of both extracted mass and normalized to equivalent vehicle miles.