Total particulate from automobile exhaust

≃ 0.35 g/mile or ~ 5 g/gallon of fuel consumed

Total particulate from diesel exhaust ~ 50 g/gallon of fuel consumed

The level of emissions depends on fuel composition, engine design, operating conditions, and other variables.

Gasoline-engine exhaust particulate contains the following (if leaded fuel is used):

Pb (mostly in compounds) 20 to 40%

Carbon particles and various organic compounds, including raw or partially burned lubricating oil - variable ≈ 40%

Compounds of Ca and Mg ~ 2%

Cl and Br (in Pb compounds mostly) - 15 to 30%

Sulfur (largely as sulfate) - up to a few %

Fe and Fe oxides - a few %

Zn - a few tenths %

Al, Si, Cu - traces

The Pb, Cl, and Br are present by virtue of the tetra-ethyl lead together with the ethylene chloride and bromide added to scavenge the lead. Lead compounds that have been reported include PbClBr, $NH_4Cl(PbClBr)_2$, $(NH_4Cl)_2$ PbClBr, $[Pb_3(PO_4)_2]_3PbClBr$ if phosphorus additives are present, $PbSO_4$, and $PbO \cdot PbSO_4$ (see Refs. 4, 25, 30, 31, 32, 36). The lead halides form by condensation from the vapor phase as the cooling exhaust gas reaches the 350°C range. The Mg,Ca, and Zn are primarily from the lubricating oil, the ferrous material from wear