The transport sector emission is one of the most important air pollution source for fine particles (PM2.5) and gaseous compounds in urban areas of South America. In a comprehensive experiment in Brazil, six capitals cities had fine particles (PM2.5) 24hours samples collected during two years. The filters were submitted to gravimetrical analysis for identification of PM2.5 concentration, reflectance for Black Carbon concentration, X-Ray fluorescence analysis for elemental composition and to ion chromatography for anions and cations composition and concentration. This project was conducted by the Medical School and Institute of Astronomy, Geophysics and Atmospheric Sciences both from University of São Paulo. The average PM2.5 concentration were 28, 19, 17, 17, 16 and 11 µg/m³ in São Paulo, Rio de Janeiro, Belo Horizonte, Curitiba, Porto Alegre and Recife, respectively. Black Carbon, accounted for approximately 30% of the PM2.5 mass concentration in the analyzed cities. The elemental chemical composition of the PM2.5 was used to identify several distinct source-related fractions of fine particles, by means of Multivariate Models. The results were used to examine the association of these fractions with daily mortality in each of the six cities. Soil and crustal material factor, a Black Carbon factor classified as motor vehicle exhaust and biomass burning, a Sulfur factor representing residual oil combustion, and more additional factors were the sources identified. The vehicular fleet explained at least 40% of the fine particles mass concentration in the six cities.