Three-years of daily chemical data sets consisting of major water-soluble constituents, mineral aerosol and carbonaceous species in ambient PM10 samples were obtained over 16 urban, rural and remote sampling sites in various regions of China from 2006 to 2008. Together with those having a least an entire year observation data around the world, the annual or seasonal mean mass concentration (μg m⁻³) of six major types of aerosol in PM10 particles are synthesized for various rural and urban sites in 16 areas of the world. The mineral, sulfate, organic carbon (OC) aerosol particles are responsible for most of the PM10 aerosol mass at the majority of areas thought the world. Nitrate, ammonium and elemental carbon (EC) are also the non-ignored important chemical composition of aerosols. Globally, the mass concentrations of these major aerosols in North America and Europe are relatively lower than those in Asia. Comparing with the urban hot spots, much lower concentrations are observed in rural area where more regional dispersed aerosols observed with relative longer resident time, which may play greater role on climate change. China’s aerosol, as an important and major part of the global aerosol, has its unique characteristics. The monthly, seasonal changes and some signatures related with SA, SOC, and aerosol acidities are also evaluated for China’s aerosol.