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Abstract

Mineral dust aerosols, produced by wind erosion in arid regions and semi-arid surfaces, are important components of the atmosphere that affect the Earth radiative budget, atmospheric chemistry and biogeochemical cycles. Dust aerosol particles are composed of a complex mixture of various minerals, mainly clays, calcite, quartz, feldspars and iron oxides. The nature and the relative abundance of the minerals are key parameters to evaluate mineral dust environmental impacts. Strong limitations remain to quantify the mineralogical composition of dust particles, mainly due to the low mass of in-situ collected dust particle samples. In this study, an analytical method and X-Ray Diffraction (XRD) measurements are presented to quantify the mineralogical composition of low mass aerosol particle samples. The method is applied on reference minerals (illite, kaolinite and palygorskite) commonly present in desert