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Identification of trace elements in ambient air can add substantial information to pollution source apportionment studies, although they do not contribute significantly to emissions in terms of mass. A method for quantitative size and time-resolved trace element evaluation in ambient aerosols with a rotating drum impactor and synchrotron radiation based X-ray fluorescence is presented. The impactor collection efficiency curves and size segregation characteristics were investigated in an experiment with oil and salt particles. Cutoff diameters were determined through the ratio of size distributions measured with two particle sizers. Furthermore, an external calibration technique to empirically link fluorescence intensities to ambient concentrations was developed. Solutions of elemental standards were applied with an ink-jet printer on thin films and area concentrations were subsequently evaluated with external wet chemical methods. These customized and reusable reference standards enable quantification of different data sets analyzed under varying experimental conditions.

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