

Interactive comment on “A TGA/FT-IR study for OC and EC quantification applied to carbonaceous aerosol collected in Milan (Italy)” by P. Fermo et al.

Anonymous Referee #2

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The manuscript (MS) deals with the measurement of the carbonaceous aerosol constituents by a modified and extended, two-step thermo-gravimetric method with Fourier-transformed infrared spectrometry detection. Model samples prepared by mixing chemical compounds, as well as real atmospheric aerosol samples collected on quartz fiber filters in an urban environment were analysed by the method. Operational parameters including heating temperature and rate, isotherm duration, carrier gas and its flow rate were investigated and optimized. The topic is timely and of importance for a larger research community and, therefore, it is definitely within the scope of the journal. Nevertheless, the MS can be improved in certain ways, some of which are

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addressed as follows.

General comments

The FT-IR detection method makes it feasible to measure not only the evolved CO₂ gas but water vapor and other gases exhibiting considerable IR absorption as correctly mentioned in the text. The present referee misses a brief conclusion whether these signals could indeed be or could have been detected and utilized for the analytical work. The authors may want to specify the analytical performance (e.g., determination limits, typical uncertainties, etc.) of the measuring method developed more explicitly. They should also mention in the text that the comparison of the presented method with the TOT (or TOR) methods was just preliminary, and that the real intercomparison should have been (will be) more rigorous and complex. Since one of the conclusions was the contribution of OC and OM to the PM mass, the authors should mention the problems and uncertainties associated with weighting quartz filters. It is strongly suggested that the rounding off strategy in the MS is revisited because too many significant digits were given at many places in the MS, e.g., p. 2: 29.3 (12.8)%, p. 16: 200.0 g/m³). The scatter plots in Figs. 8a and 8b are to be reformatted to squared layout to facilitate visual inspection as well. The title of the MS could be changed to more adequate form, for instance: A TGA/FT-IR method for measuring OC and EC in aerosol samples, or similar.

Specific and technical comments

The abbreviation PM₁₀ is explained on pages 15 and 16 only, and not at its first usage. Utilization of expression “respectively” is not in the correct order many times in the text, e.g., p. 2 line 17, p. 6 line 5, p. 8 line 9 from bottom, p. 14 line 21, etc. Explain the meaning of the abbreviation LSCE on page 5. Change: Dioxide carbon to: Carbon dioxide on p. 7. Replace: std. weight by: Mass of standard (or similar), and carbon quantity by: carbon content in Tables 2 and 3. The correct name of the TOT method is thermal-optical transmission method, cf. Table 4.

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All corrections can hopefully be performed by a minor revision and modification of the MS, and therefore, according to this referee, the present MS can be suggested for publication in a special conference edition of the Atmospheric Chemistry and Physics Discussions.

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 4335, 2005.

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