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## Critical assessment of the current state of scientific knowledge, terminology, and research needs concerning the role of organic aerosols in the atmosphere, climate, and global change

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**Abstract.** In spite of impressive advances in recent years, our present understanding of organic aerosol (OA) composition, physical and chemical properties, sources and transformation characteristics is still rather limited, and their environmental effects remain highly uncertain. This paper discusses and prioritizes issues related to organic aerosols and their effects on atmospheric processes and climate, providing a basis for future activities in the field. Four main topical areas are addressed: i) sources of OA; ii) formation transformation and removal of OA; iii) physical, chemical and mixing state of OA; iv) atmospheric modelling of OA. Key questions and research priorities regarding these four areas are synthesized in this paper, and outstanding issues for future research are presented for each topical area. In addition, an effort is made to formulate a basic set of consistent and universally applicable terms and definitions for coherent description of atmospheric OA across different scales and disciplines.

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